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INDIA RUBBER WORLD

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Volume 100 | June 1, 1939 | Number 3

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India Rubber World *assumes no responsibility for the statements and opinions advanced by contributors.*

Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Cable Address, Elbill, New York. Subscription $3 per year postpaid in the United States and Mexico; $3.50 per year postpaid to Canada; $4.00 per year postpaid to all other countries.

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Other Bill publications are: *Premium Practice, Rug Profits, Sales Management, Soda Fountain,* and *Tires.*

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R. T. VANDERBILT CO., Inc.
230 PARK AVENUE NEW YORK, NEW YORK

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, New York, N. Y.

Volume 100 **New York, June 1, 1939** **Number 3**

Aqueous Dispersions of Crude and Reclaimed Rubber

R. E. Nelson [1]

DISPERSITE is the result of human ingenuity in matching nature's gift from the rubber tree—natural latex. It is a colloidal suspension of crude, reclaimed, or synthetic rubber in water. The suspension is made by kneading the rubber mass in a mixer in the presence of very small amounts of dispersing agents such as soap forming chemicals, proteins, clays, or combinations of such materials.

It is believed that the original latex particle never completely loses its identity even during the various processes of coagulation, milling, vulcanization, use, and reclaiming. Water is added during the kneading process, and the peptizing agents are worked into the protein layer surrounding the rubber globules which make up the mass of the dry rubber. This action restores the electrical charge on the globules. As the kneading process proceeds, increasing amounts of water are absorbed, and the rubber globules are gradually separated until they are entirely free of each other, at which time there is a reversion of phase and the rubber particles become suspended in water. Further dilution gives freedom to the particles, and a stable colloidal suspension results. In this stable liquid form Dispersite is modified for a wide variety of uses including adhesive and coating applications; dipped goods manufacture; saturations; molding; plasticizing and flexibilizing purposes; admixture with other materials including latex; and as a means of carrying and dispersing other solid materials in master batching.

Types of Dispersite

There are two general groups of Dispersites; the straight dispersions of rubber similar to natural latex, and the compounded Dispersites prepared for specific applications. The unmodified Dispersites are of low viscosity and surface tension and are made with crude rubber or various types of reclaimed rubber. They offer the user a basic raw material similar to latex to which he can apply his own compounding technique and materials.

The compounded Dispersites comprise the more interesting group for they can be endowed with properties impossible to obtain as cheaply or adequately by any other means. This is possible because the compounding is done in the mixer during the dispersing process, resulting in a combination of dry milling and wet compounding effects. For example fillers, gums, resins, and other modifying additions are made to the dry rubber batch and then dispersed so as to become integral with the rubber. Such additive materials which are intended to modify the condition of the dried rubber film accomplish their modifying effect before deposition of the film and therefore more effectively. By this means extremely tacky Dispersite films can be produced. The value of vulcanizing ingredients added in this way enhances their effectiveness by bringing them into close contact with the rubber hydrocarbon and disposes of the expense of separately pasting the chemicals before addition to the rubber suspension. Other heavy-loading pigments are prevented from settling out and forming a hard deposit on the bottom of the container.

The viscosities of these Dispersites are controlled during manufacture to suit the requirements of the process in which they are used. They are produced in low viscosities for saturations or spray applications, in heavier consistencies for various brushing or pick-up roll applications, and in high viscosity pastes for spreader work. They can be diluted with water or other materials in suitable solution or suspension.

The compounded Dispersites may be grouped in two general sub-divisions. The first comprises merely curing prototypes of the plain Dispersites for those who prefer to do their own compounding, but want to take advantage of economies in the addition of curing ingredients. The other group comprises the Dispersites designed for specific uses, and these may or may not be of the curing type.

What has been stated so far applies equally well to Dispersites of crude rubber and to those made from reclaimed rubber. It now becomes necessary to distinguish between these types of base stock.

[1] Dispersions Process, Inc., 1790 Broadway, New York, N. Y.

Crude Rubber Dispersites

Crude rubber must be masticated to prepare it for dispersing; therefore films laid down from crude rubber Dispersites will show the typical soft, transparent, and tacky properties of milled rubber. Their properties give to such Dispersites advantages in the adhesive field where they are used as additions to general adhesives and to latex in order to improve the tack properties. Crude rubber Dispersites can be made with less than 3% water solubles remaining in the dried film, which makes them highly desirable for applications where water resistance is required of the rubber.

Dispersites of crude rubber are used for purposes where crude rubber is normally used and especially where liquids or pastes are necessary or where the technique of milling rubber would disintegrate the other ingredients. For instance in abrasion wheels, which consist of abrasive materials bonded in hard cured crude rubber, wet mixing with Dispersite as a medium does not crush the brittle abrasive particles. Pigments and master batch materials are being deposited on Dispersite particles, which are then coagulated and dried, providing a clean, dustless, easily measurable, and more effective means of adding the ingredient to the main batch on the mill.

Usual additions of fillers, resins, gums, chemicals, etc., can be made to crude Dispersites, and the price of such compounds are comparable to similar compositions of other types of aqueous rubber dispersions.

Reclaim Dispersites

Because of the variety of raw materials available and the possibility of further diversification through compounding, Dispersites made from reclaimed rubber offer a wide variety of choice. The reclaims to be used for dispersion must be of high quality. Great care is taken in the choice of stock to assure cleanliness and uniform plasticity. The best sources are reclaims made from tires; red, black, and gray tubes; and special grades of light colored stocks.

Reclaimed rubber is the result of reviving rubber which has served a useful term of service and has been exposed to aging influences. It is well known that reclaimed rubber has excellent resistance to further aging breakdown, and this is one of the very important advantages to be taken into consideration when using reclaimed rubber Dispersites. As many applications call for thin deposits which will be exposed to sunlight, oxygen, and heat conditions, Dispersite made from reclaim offers an assurance of protection against these factors. The usual additions of antioxidants and curing chemicals further advance the bulwark of aging resistance.

Adhesives

The general adhesive field has offered an extensive opportunity for Dispersite to prove its advantage. It can be used for either wet combining or delayed combining after the deposit has dried. A very tacky compound which will retain its tack for several hours is used in applications where a rubber adhesive is demanded and where it is impossible or impractical to use the usual wet combining methods necessary with latex adhesives. Where materials to be combined are impervious to water vapor or where labor conditions prevent timing the operation, it may be necessary to get rid of the water before making the union so as to eliminate wrinkling or swelling of the material. For such operations retained tack is important and is obtained by using special Dispersites.

A very interesting and important commercial application is that of cementing parquetry flooring to concrete or such difficultly bonded flooring as rubber or asphalt tile and pressed composition products. For this work a gaged thickness of Dispersite is spread on the concrete or flooring base and allowed to dry. The flooring is then laid in place and pressed down. In test installations this adhesive has successfully withstood extreme temperature changes, changing moisture conditions and even complete inundation during flood. The adhesive is self-leveling, causes the flooring to "find the sub-flooring" readily, and produces a quiet, comfortable floor to walk on.

Textiles

The textile industry has a number of adhesive Dispersite applications which are often designated differently. Such use is sizing of carpets, punched felts and rugs, and pile fabrics where the dual purpose of locking the fibers in place and stiffening the product is accomplished in one operation.

One Dispersite is designed to be miscible with hot starch or dextrine sizes. It can be added directly to the hot starch mixture in the cooking tank in any desirable proportion without danger of coagulation and it effectively serves the purpose of making flexible the starch component and cementing the fibers.

One type of rug, the non-woven pile rug, is entirely held together by two rubber dispersions, one to saturate the backing, and another heavier coat on the backing into which the pile is pressed and cemented. Excellent nonskid coatings of Dispersites are available to provide long aging coatings which do not discolor or pick up dust readily.

In dipping operations Dispersite has been added to latex compounds as an extender to reduce the cost, and excellent quality articles have resulted. Dispersites are used alone in dipping fabric gloves and in providing tough durable coatings on fabrics.

Road Construction

A new development is the use of Dispersite in a composition used as a bonding and joint sealing material between sections of concrete floors or roadways. After being poured in the prepared seam, this composition quickly gells and sets up, producing a spongy mass which is waterproof and long aging and at the same time soft and flexible. It takes up the seasonal contraction and expansion strains caused by temperature changes, without releasing its bond to the concrete segments or extruding above the level of the road. Dispersite is also being used as an addition to road asphalts to improve the resiliency of the asphalt to thermal changes of the seasons. A small percentage added to asphalt also increases the bonding of the bituminous material to stone, trap rock, etc., and increases the adhesion of the road top dressing to the road bed, thus preventing the early disintegration of the road due to traffic and weather.

Paper

In the paper industry Dispersites have been used in saturating paper and blending with the paper stock in the beater to produce the tough rubber papers which find such outlets as artificial leather, midsoling, shoe findings, etc. Specialized cement and adhesive jobs in the paper trade find their answer in these products: laminating work, in sealing paper to paper or to fabrics, sealing bags and boxes, padding paper, bookbinding, and in starch and dextrine adhesives.

Economic Advantages

The fact that the supply of reclaimed rubber Dispersites is dependent only on domestic sources of used rubber, a thoroughly adequate and stable source of supply, is of great importance during unsettled international con-

(*Continued on page* 44)

A Romantic Research

The Personal Side of the Historical Development of Koroseal

Ralph F. Wolf

SAMUEL CITIZEN has become so accustomed to the sight of the chemists of the country sweeping basketfuls of minor miracles from their doorsteps every morning along with the broken beakers and test tubes that it takes a real grade-A marvel nowadays to make him pause.

Such a feat has been performed in the laboratory of the Midwest's oldest rubber company. Sired by a gas so corrosive that a few whiffs would eat out your lungs and dammed by another so explosive that it could level your house without half trying, this clamorous prodigy is literally unlike anything else ever before created.

The two gases which comprise its immediate ancestors are acetylene and hydrogen chloride. The first can be made from coke and limestone and the second from common salt. The two gases combine, under the proper conditions, to form a colorless, low-boiling liquid—vinyl chloride. This in turn can be polymerized—that is, the individual molecules of which it is composed can be made to gang up into new, supermolecules having entirely different characteristics. Polymerized vinyl chloride is a hard, tough, horny material. Mixed with the proper plasticizers to render it pliant and workable, this becomes Koroseal.

Featherweight Koroseal Cruise Coat and Evening Wrap Experimentally Designed in a Variety of Colors

Characteristics of Koroseal

The new laboratory infant takes after Kipling's Cat That Walked by Its Wild Lone. Utterly unsocial, it prides itself on its exclusiveness, its refusal to mingle with the molecules of commoner materials. Acids that can chew any metal save platinum and can devour stone or glass leave it untouched. Oils that insinuate themselves into the pores of many substances to swell and soften and deteriorate, practice their wiles on it in vain. The oxygen of the air, great leveler of flesh, wood, and iron, leaves its complexion unaltered. In resistance to water, a duck's back is no better than a sponge when compared to the new product of the chemist's magic.

It might be expected that such an invaluable Jack-of-All-Trades would command an exorbitant price. Such is not the case. Koroseal is made of low-priced raw materials, and, as its production graduates from a semi-plant scale to full-plant operation, its price will drop to a comparatively low level.

Unlikeness to Rubber

Though a rubber laboratory was its birthplace and rubber chemists the obstetricians, Koroseal is not a synthetic rubber in any sense of the word. Crude rubber is a plastic substance which is soft and sticky in warm weather, iron hard in cold. To become of real use it must be mixed with sulphur, molded, and subjected to heat. Thus vulcanized, it loses its plasticity, but gains greatly in elasticity and is no longer subject to the whims of the weather. Raw rubber dissolves readily in petroleum solvents, is attacked by strong acids, absorbs water and falls prey to light and to the oxygen in the air. Vulcanized rubber, not as easy a victim of these destructive agents, is swelled by oils and cannot resist all acids. Oxygen and light still attack it, although more slowly.

Unlike rubber, Koroseal does not have to be cured, and it is indifferent to the rubber enemies mentioned. Again, unlike raw rubber, Koroseal is not as seriously affected by the ordinary extremes of temperatures. It is plastic at higher temperatures, however, and to be made into useful objects needs only to be molded in the neighborhood of 300° F. Upon cooling, the formed Koroseal article is no more adhesive than a buttered eel. On the debit side of the comparison is the present fact that Koroseal is only slightly elastic when contrasted with rubber. For that reason it may never compete against rubber where elasticity is an essential characteristic and thus is barred from the field in which rubber finds its greatest usefulness—transportation. In the tire and tube industry rubber knows no rival.

Early Research Activities

Prior to the 1920's the well-equipped, well-staffed, well-financed research departments of the present day were uncommon in the rubber industry. Chemists were hired to test the quality of raw materials and to solve factory problems and had neither the time nor the approval of their superiors needed for delving into the hundreds of fundamental questions about rubber that have never been answered.

More than some of the other major companies, the Goodrich company was disposed to look upon the money "wasted" in research with a lenient eye. For from the one-room laboratory of the Diamond Rubber Co., consolidated with Goodrich in 1912, there had come in 1906 the second greatest discovery ever made in the history of rubber. This was the finding of organic substances which speeded up rubber vulcanization. By itself, sulphur is extremely slow about "curing" raw rubber. Accelerators speed up the reaction tremendously in addition to producing a better final product. Their discovery by

George Oenslager, lanky technician not long out of Harvard at the time, saved the Diamond company hundreds of thousands of dollars before competitors knew what was going on. One authority has estimated that Oenslager's work saved the American rubber industry as a whole an investment of more than $200,000,000 in buildings, presses, molds, and power plants which would have been needed to maintain the present volume of production without accelerators.

With such an achievement on the records it is easy to see why the Goodrich company in the immediate postwar period regarded research with a less jaundiced eye than some of its rivals. Vice President William C. Geer, himself a chemist, had long wondered what more could be done with rubber besides making it combine with sulphur. A dozen other fundamental questions were in his mind. At last he was given permission to start a real research department, and he began by bringing in a group of extremely able men headed by Dr. Harlan L. Trumbull, who had been successively University of Washington faculty member, fellow at Mellon Institute, captain in the Chemical Warfare Service, and expert with the War Trade Board in the interval between his scholastic days at the Universities of Washington and Chicago and his entrance into the rubber business. A fresh and unprejudiced viewpoint led the new man immediately to ask the same question that had bothered Geer—what else will rubber do besides combine with sulphur? Fair time it was that someone asked, for in all the eighty odd years that had passed since the day Charles Goodyear discovered sulphur vulcanization, hardly anything else had been studied but this one reaction. Rubber men had not bothered to find out if anything else would change rubber in any other way.

Dr. Harry Fisher was given the task of making all the rubber derivatives he could devise, a job in pure research work with no particular prospect of profit. Chlorine derivatives were studied, rubber was brominated, nitrated, treated with sulphuric and sulphonic acids. This last produced the first notable results—an isomer of rubber. Isomers are materials made up of the same elements in the same proportions and yet are different in properties. In this case the new substance was identical with rubber in composition but altogether different in its characteristics. Labeled Thermoprene, the rubber cousin formed the basis for most of the bonding of rubber to metal of recent years; most spectacular of the installations is in the huge pickling tanks of the steel industry. Shipment of strong chemicals in tank cars has also been made possible by this discovery.

Although this work had no direct bearing on Koroseal it helped make possible the discovery of the prodigy almost half a decade later.

Research for Rubber-like Materials

Koroseal, although far from being a synthetic rubber, owes its existence to one of the innumerable campaigns which have been waged to duplicate the product of the *Hevea* tree in the laboratory. This particular caoutchouc crusade had its origin in the laboratories of the huge rambling factory founded by Dr. Benjamin Franklin Goodrich at Akron seventy years ago.

For nearly fifty years prior to 1925, people had lusted after the secret. It is easy to see why. In the half century prior to the depression of 1920 and especially in the years after the coming of the automobile, the supply of rubber had never been able to keep up with the demand. This constant scarcity resulted in prices which ranged as high as $3.06 per pound in April, 1910. The man who discovered how to make rubber cheaply would have become many times a millionaire.

Repeatedly the welkin was split by clamorings from widely separated laboratories that the problem had been solved and that rubber from potatoes or turpentine or petroleum was now an actuality. Early in the present century some of the stories were taken seriously enough to cause panics in plantation securities and elicit protests from the poorer classes who feared increases in the prices of foodstuffs that were going to be turned into rubber.

Many of the discoveries were outright frauds designed to pry funds out of an unwary public. Most of them, though, were announced by sincere, but misguided scientists who were mistaken in their results or else had an expensive substitute of a sort that failed miserably in competition with rubber. Each successive cry of "Wolf" drew less attention as the public grew used to seeing the lupine specters evaporate with the sun. Greatest of all drives to produce a synthetic rubber was made in Germany during the World War. During the years of preparation for the conflict the high command apparently neglected the fact that rubber, never of importance in previous wars, had become absolutely essential for communications, for transportation, for gas masks, for airships. The German need became desperate after a few weeks of an English embargo on rubber, and unlimited money and brains were made available for the solution of the problem. The only result was a highly unsatisfactory substitute costing nearly $30 a pound.

A story in itself, but one wholly irrelevant to the story of Koroseal is the fact that nowadays synthetic rubber is an accomplished reality, and its manufacture gives promise of being one of the most rapidly growing industries during the next ten or twenty years.

It is important that the whole idea of artificial rubber was in deepest disrepute. President B. G. Work, of Goodrich, voiced the common opinion when he said: "You can never compete with nature," in making it very clear that appropriations for synthetic rubber research stood no chance of approval. Chemist Trumbull wanted to pry into the problems of synthetic rubber-like materials, but knew better than to broach the proposition. Diplomatically, he pointed out that the company's position in regard to Thermoprene would be endangered if competitors learned how to make the rubber isomer in some other fashion. Money was immediately forthcoming, not for synthetic rubber study, but for work on rubber-like materials.

Koroseal Lined Acid Tank

Trumbull knew whom he wanted in charge of the work and lost no time in engaging Dr. Waldo Semon, of the University of Washington. The brilliant young teacher strapped

five spare tires on the rear of his open Model T, wound it up, and started eastward accompanied by his fellow Phi Beta Kappan classmate, and wife and a baby daughter. Undaunted by misfortunes which included eighteen flat tires, almost as many sets of worn bands, miscellaneous tinkering of assorted nature, and frequent strandings due to rainstorms, the family inched up the western slope of the Rockies, rocketed down the other side, and rattled across the plains to its destination, Akron.

Dr. Waldo Semon

Semon Invents Koroseal

The Odyssey ended, Semon found a rubber laboratory to be a haven for organic chemists. He had concentrated on physical chemistry, knew no more of the organic branch than he had needed to obtain his degree. He perfected himself as an organic chemist after he arrived at Goodrich by dint of long hard hours of reading and study. Among the books and papers he digested at this time was a monograph by a noted Russian, Ivan Ostromislensky, dealing with vinyl chloride polymers. Semon worked for several months along conventional lines on the problem of synthetic rubber-like materials and then asked if he might try another attack. He had a hunch that he might be able to take the hard, tough, horny material described by the Russian, soften and make it plastic, and convert it into a useful material. He succeeded beyond his expectations and early in 1927 had samples of a rubber-like composition which he had made by plasticizing polymerized vinyl chloride. This was Koroseal, and within a few months Semon had discovered every important property of the substance including its remarkable resistance to everything imaginable. Then he turned his wonder child over to others for commercial development and interested himself in new problems. From his later work, it might be added, has developed a million dollar business in rubber age resisters.

Dr. Waldo Semon was born in Demopolis, Ala., in 1898, but the populace of the tiny town on the Tombigbee River can be excused for not knowing that he is beyond any doubt their most eminent native son. So great is his modesty and shyness that he is unknown outside of his own profession. All seven of his college years were spent at the University of Washington where he taught chemistry from the time he received his bachelor's diploma in 1920 until he joined Goodrich in 1926. Putting himself through school by working in the winter at the plumbing trade learned as a boy and in the summer on a surveyor's gang in the Washington mountains did not keep him from winning the highest scholastic honors. When occasion demands, he can still do a neat job of pipe fitting in the laboratory, and he himself did all of the plumbing in his home at one of Akron's many suburban lake communities.

Semon is literally a giant of a man, physically as well as mentally. He is modeled on so capacious a plan that his automobile has to be specially built to fit, with a low seat to enable him to see out of it. Although a good marksman on the target range, he is also a true nature lover and does not care for hunting. Very much a boy himself in many ways, he has a great liking for boys and understands them as well as the carbon and hydrogen atoms he manipulates in the laboratory. When the youths of his neighborhood attend one of the chemist's parties, they find to their great delight that they must enter through a cellar window; nothing so prosaic as a door will do.

Practical Development

The commercialization of Koroseal has been achieved by the cooperation of a score of trained men. Because Semon early found that the material was not touched by nitric acid, those working with it at the outset saw it as a tank lining material and thought of nothing else. They struggled futilely, for Koroseal was stubborn stuff, and the chemists had not yet learned how to make it tractable. Time elapsed, with only sporadic work being done, until 1932 when J. W. Schade, in charge of all Goodrich research, convinced the company management that the substance merited intensive study in spite of early failure to process it.

As they continued to work with Koroseal, the laboratory men found it very adaptable to manipulation on rubber working machinery. They learned how to mill it with other ingredients, how to calender it into thin sheets, how to coat cloth and paper with it, how to extrude it in any desired shape. More important, they found a few organic solvents that would dissolve it and thus were able to prepare solutions for dipping and painting. Young chemist Edward Newton again thought of the tank lining problem and wondered if Koroseal painted so as to form a thin film might not be satisfactory. Late one afternoon he coated a pill box with such a film, filled the box with nitric acid and placed it on a hot plate before he went home. The next morning he found the fragile cardboard box just as he had left it, previously an unheard of thing. Thus began the practice of dipping in solutions of Koroseal the plating racks and other metal objects that were to contend with corrosive liquids. They know now how to make it adhere to metal, and a steadily increasing use in lining tanks and pipes is foreseen.

Koroseal can be made soft as jelly or as hard as horn. The soft form (Korogel) was the first product sold commercially; it was found highly satisfactory for making flexible molds of art objects from which plaster reproductions could be turned out with great facility.

Because of its indifference to oil, molded Koroseal parts are being used in hydraulic shock absorbers and in other places where gaskets, cups, or plungers must withstand oil or grease. This property makes it valuable also for cable sheathing. Then, too, the public some day may find itself buying motor oil in Koroseal coated paper bags instead of glass jars or tin cans.

The material can be applied to any textile fabric either as a transparent coating or in bright colors. Brightly colored printed silks and linens with clear coatings or plain fabrics with colored coatings can be made into raincoats and umbrellas which are not only more attractive than similar rubber goods, but also more resistant to water and unaffected by light and air. Again, the product lends itself to the making of bright canvas awnings which will not fade in the summer sun. Work coats and jeans coated with Koroseal are also finding favor with manual workers in chemical industries.

Koroseal does not depend on fabrics for its strength. It can be made into tough, flexible, and very thin transparent films colorless as water or brightly colored and

(*Continued on page* 44)

Distributers' Tire Stocks

In the United States, April 1, 1939[1]

PRECEDING the current survey of retail stocks of automobile tires and inner tubes, industry statisticians consulted as to the form of our report recommended that stocks of individual dealers be estimated as a total, instead of separately for large dealers alone as heretofore. In the period of these quarterly surveys, as the changing dealer mailing list has been built up, an increasing percentage of those included in our tabulations has been small dealers. Consequently the comparative returns have been considered (with probably negligible violence to accuracy) as representative of the average stocks of small and large dealers combined as of the larger dealers above. The summary stocks reported below for individual dealers have therefore been raised to allow for casings and inner tubes held by small dealers, estimated in previous reports to range between one million and one-and-a-quarter million casings. With this change, the bases and methods described in previous reports have been used in calculating stocks held by the following three groups of distributers: 1. Individual dealers, including large and small retailers. 2. Distributers through oil company chains. 3. Manufacturer-owned-and-operated, mail-order house, and other important retail chains.

Distributers' Stocks Indicated by Surveys

As a result of the changes in dealers' stocks, total distributers' stocks of casings as estimated below have fluctuated between 6,418,000 and 7,992,000 in the past three years, instead of between 5,493,000 and 6,622,000 as estimated (incomplete) in previous reports. An overall increase of 270,000 casings is estimated for the first quarter of 1939, increases in dealers' and mass distributers' stocks exceeding a decline of 113,000 in oil companies' holdings, but in comparison with the April average for 1936-1937-1938 current stocks are lower by 7.5% on 558,000 casings. Total distributers' stocks of casings are for the first time higher than their total stocks of inner tubes. The growing percentage of business concentrated in a few of the leading tire sizes is an important factor in reducing the volume of stocks of casings necessary for distributers to service tire users.

	Thousands of Casings			
1936	Dealers	Oil Companies	Other	Total
April 1	3,610	1,543	1,890	7,043
October 1	3,390	1,757	2,110	7,257
1937				
April 1	3,835	1,853	2,304	7,992
July 1	3,363	1,996	2,299	7,658
October 1	3,000	1,774	2,289	7,063
1938				
January 1	3,015	2,115	1,920	7,050
April 1	3,007	1,869	2,051	6,927
July 1	2,767	2,079	2,163	7,009
October 1	2,588	1,840	1,990	6,418
1939				
January 1	2,735	1,838	1,920	6,493
April 1	3,018	1,725	2,020	6,763

Total distributers' stocks of inner tubes have ranged between 6,640,000 and 9,099,000 on the various dates of surveys during the past three years, as estimated below. The low figure of 6,643,000 is estimated as of April 1, closely approaching the low record of October 1, 1938. While an increase during the first quarter is shown for dealers' stocks, oil companies and other mass distributers report record low inventories of inner tubes. Compared with the average for the three preceding Aprils, current inner tube stocks are reduced 21%, or 1,772,000 tubes.

	Thousands of Inner Tubes			
1936	Dealers	Oil Companies	Other	Total
April 1	4,538	2,040	1,902	8,480
October 1	4,220	2,097	2,228	8,545
1937				
April 1	4,910	2,019	2,170	9,099
July 1	4,050	1,960	2,129	8,139
October 1	3,525	1,957	2,038	7,520
1938				
January 1	3,547	2,127	1,717	7,391
April 1	4,021	1,918	1,728	7,667
July 1	3,560	1,805	1,786	7,151
October 1	3,132	1,781	1,727	6,640
1939				
January 1	3,445	1,733	1,599	6,777
April 1	3,460	1,626	1,557	6,643

Dealers Reported Stocks

The following table compares the stocks reported by 1,302 dealers for 1,841 stores in the current survey, with the stocks reported by the identical firms January 1, 1939. Dealers holding under 200 casings each have lower total stocks of casings; while casings stocks of the larger dealers have increased; dealers holding over 500 casings each have lower total stocks of inner tubes; while tube stocks of the smaller dealers have increased. The overall results indicated are the increases in casings and in inner tubes inventories reflected in the index numbers and carried into the summary above. For the dealers with over 500 casings each, the ratio of inner tubes to casings is much lower than in previous surveys.

	April 1, 1939					
	Number of		January 1, 1939		April 1, 1939	
Number of Casings	Dealers	Stores	Casings	Tubes	Casings	Tubes
Under 200	824	989	76,572	103,109	75,388	108,485
200-500	285	405	84,379	99,575	88,448	108,201
Over 500	193	447	205,768	278,147	240,289	240,578
Total	1,302	1,841	366,719	480,831	404,125	457,264
Other April, '39	302	432			105,435	130,119
Total April, '39	1,604	2,273			509,560	587,383
Index Numbers			77.8	97.9	85.8	98.9

Oil Company Distributers' Reported Stocks

Reports were received from 42 identical firms distributing tires through chains of filling stations. Some reports covered stocks in central warehouses only; while others also covered stocks in retail outlets, in the April and January surveys. A reduction in stocks of casings, and a slightly smaller reduction in stocks of inner tubes noted from the comparative tabulations, are recorded in the index numbers and summary estimates. Of the totals reported below, firms with 17,732 outlets April 1 were

(*Continued on page* 50)

[1] Special Circular, Vol. 13, No. 7, Rubber Section, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

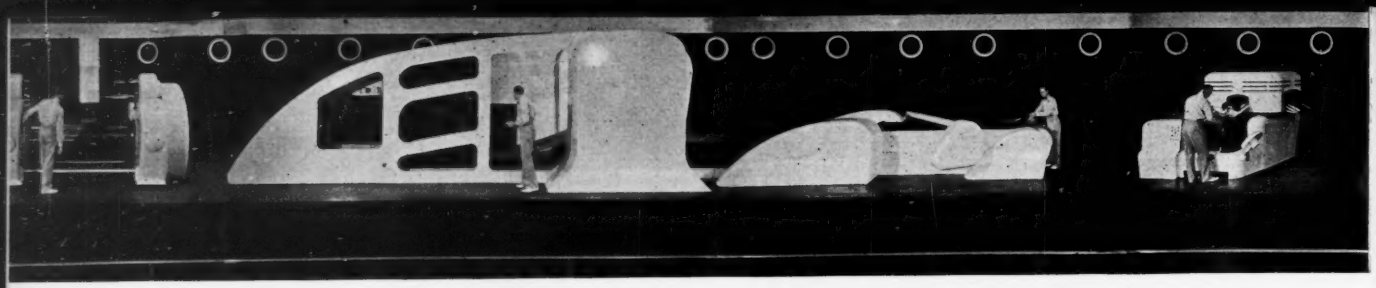
Rubber at the Fair

FLANKING the great transportation area at the western end of the New York World's Fair in Flushing, N. Y., are two major rubber company exhibits, Goodrich and Firestone. To the rubber man these two exhibits alone may well constitute a fair within a fair. However, should his curiosity on this subject be still unsatiated, there are many other exhibits in which rubber plays an important role, either as a part of the exhibit or in the construction of the building itself. United States Rubber, du Pont, General Motors, among others, have exhibits relating to rubber. We point out the highlights on rubber in this "World of Tomorrow."

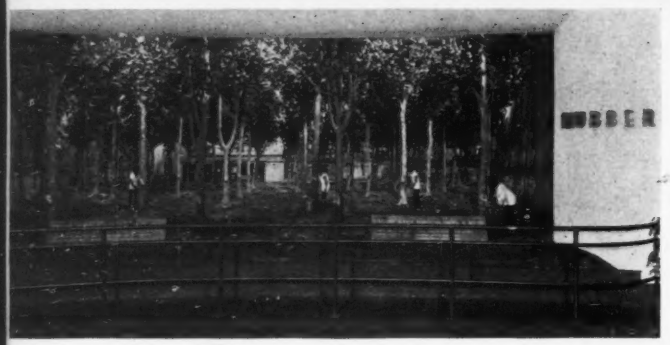
Goodrich

A spacious arc-shaped building with a central 90-foot tower and floors of multi-colored rubber tile houses the Goodrich fair exhibit. An adjacent outdoor proving ground enables Jimmie Lynch and his auto daredevils to demonstrate the durability of tires under the tremendous strains placed on them by careening around sharp turns and hurtling off ramps at various levels. His stunts include an 85-foot leap over a parked truck.

Within the building is depicted a cross-section of the company's many manufacturing and research activities. Rubber gloves are made from latex by the Anode process, and miniature souvenir tires with the Silvertown tread are molded in a 150-ton press. In the Koroseal display polyvinyl chloride is mixed with plasticizer and pigment on a laboratory mill and then extruded, the Koroseal tube being cut, heat sealed, and formed into ornaments. Koroseal coated and impregnated fabrics and wearing apparel are on display; while an exhibit lounge features slip covers, draperies, and wallpaper treated with this substance. A footwear exhibit shows the steps in the construction of canvas-rubber footwear; while, depicting the firm's outstanding contribution to aviation, a model airplane is shown with a de-icer in operation. This exhibit is augmented with a newly developed airplane brake. The flexibility of pipes with Flexlock rubber joints is demonstrated, and a railway truck with rubber-in-shear cushioned wheels and rubber springs is on display. The adhesion of Vulcalock cement and the strength of rubber are spectacularly presented by the suspension of an automobile and its lifting frame, a total weight of 4,800 pounds, by means of a solid rubber cylinder, 4½ inches



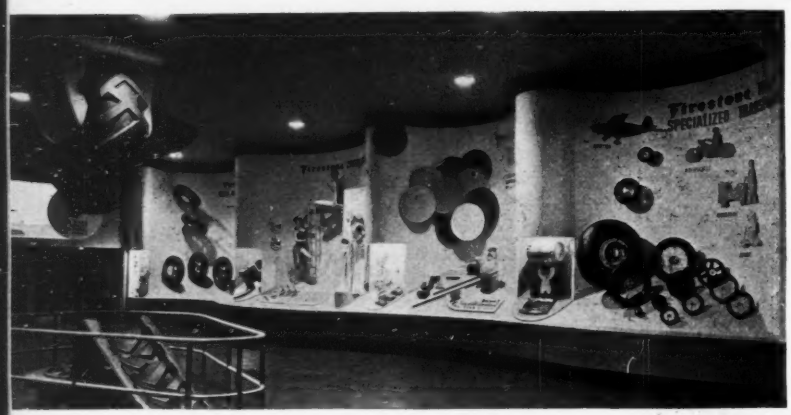
Firestone Tire Factory



Diorama of Firestone's Liberian Plantation

in diameter and 12 inches long, the cylinder being cemented to the metallic lifting connections with Vulcalock.

The exhibit also includes: many different types of automobile, truck, tractor, implement, and airplane tires; rubber-tired farm implements; a tire guillotine which sends a blunt blade plummeting down from a height of 70 feet to crash upon a fully inflated tire; a Seal-O-Matic tube and tire assembly which visitors may test for puncture resistance; a display of rubber automotive parts; the new Torsilastic auto spring, comprising rubber in torsion bonded between concentric metal shells; a large-scale model of the firm's Super Electro-Pak battery with a cutaway corner showing its construction; and a display of Goodrich auto accessories. A motor equipped with vibro-insulators, rubber-in-shear mountings, demonstrates the reduction of vibration by the use of rubber. Tree surgery is displayed by showing cavities in actual trees which have been covered with rubber and filled with wax. The exhibit is completed with large window displays of many of the 32,000 Goodrich products, illustrating the multi-purpose application of rubber.

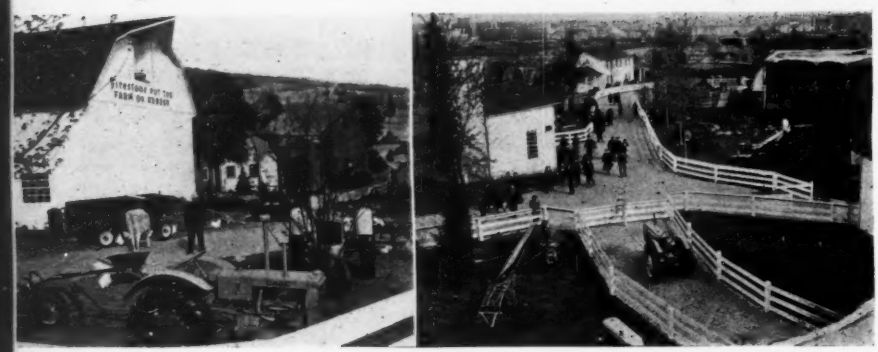


Firestone Products Hall

Firestone

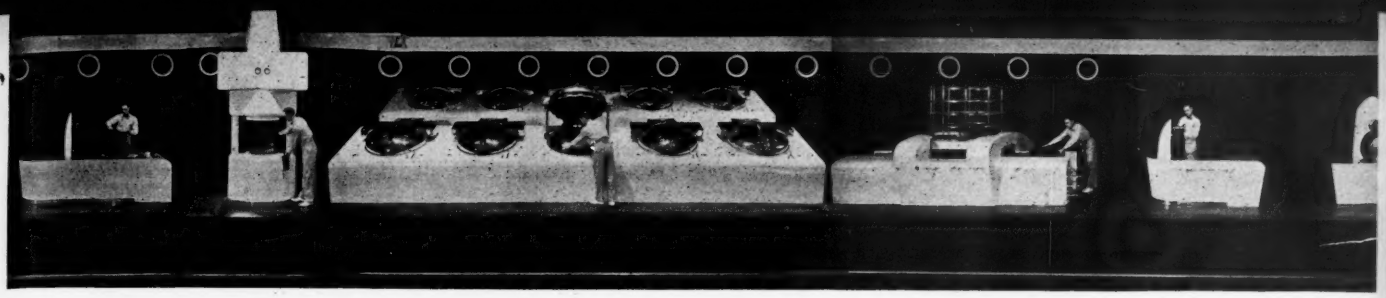
Covering three and one-half acres, the L-shaped Firestone building, with a huge rotunda entrance and 100-foot illuminated vertical fin, presents five distinct exhibits: a modern tire factory; an American farmyard; singing color fountains; reproduction of a rubber plantation; and a product hall.

In the tire factory where a finished tire is produced every four minutes, attendants operate white streamlined machines arranged in a straight line, while visitors watch from galleries and hear the process described through loudspeakers. The keynote of the Firestone farm, with its diversified livestock in a realistic background, is the equipment of farm vehicles with pneumatic tires. Among the many implements so equipped are: threshers, plows, planters, tractors, manure spreaders, potato diggers, cultivators, sprayers, binders,



Firestone Farm

Goodrich—*Left*, Vulcalock-Rubber Suspension Test; *Center*, Torsilastic Auto Spring; *Right*, Footwear



mowers, combines, hay wagons, and wheelbarrows. Set in a pool surrounded by lawns, flowers, and hedges, are singing color fountains where changing colored lights and domes of misty spray are synchronized with the tonal variations of music.

In the products hall some of the more important of the firm's products are shown, including: tires of all types; Controlastic rubber thread; Airtex, sponge rubber from aerated latex; plastic articles; and automotive rubber parts. The gathering of latex by natives on the Firestone plantations in Liberia is dramatized by an animated diorama with plantation factory operations in the background. A small-scale reproduction of Firestone's Akron plant and huge murals depicting essential materials used in tires dominate the scene in the rotunda.

Ford and General Motors

Located in the Ford building is a revolving turntable 100 feet in diameter and 30 feet high on which nearly 100 diagrammatic models illustrate the principal operations in the conversion of 27 raw materials, including rubber, cotton, and sulphur for tires. The Ford Road of Tomorrow comprising ascending and descending spiral ramps features a surface made from latex and cork, known as Monocork.

The Inland Mfg. Division of General Motors has three displays at the latter's exhibit: a show case of rubber automotive parts; rubber steering wheel display; and rubber ice-cube trays. Also a small diorama depicts Goodyear's discovery of vulcanization a century ago. In the construction of the exhibit building 25 tons of rubber were used. Approaches and ramps leading to "Highways and Byways of Tomorrow" are surfaced with the Monocork; while the carry-go-round with moving seats in this Futurama display, which is powered by 23 motors, utilizes rubber tires for traction.

Ford—Rubber, Cotton, and Sulphur Conversion

Du Pont and United States Rubber

The du Pont exhibit at the fair, a "Wonder World of Chemistry," is identified by a 100-foot vari-colored tower comprising a large-scale chemical equipment assembly, upon which lights play to simulate the flow of colored liquids. The exhibits within the building emphasize research, showing how industry and mankind are served by the transformation of basic raw materials into new and useful products. The Neoprene exhibit displays a laboratory mill and small electrically heated press for compounding and curing Neoprene. To illustrate to the visitor the resistance of Neoprene to oil, Neoprene and vulcanized rubber rings which have been subjected to oil immersion for three days at 120° F. are tested for tensile strength.

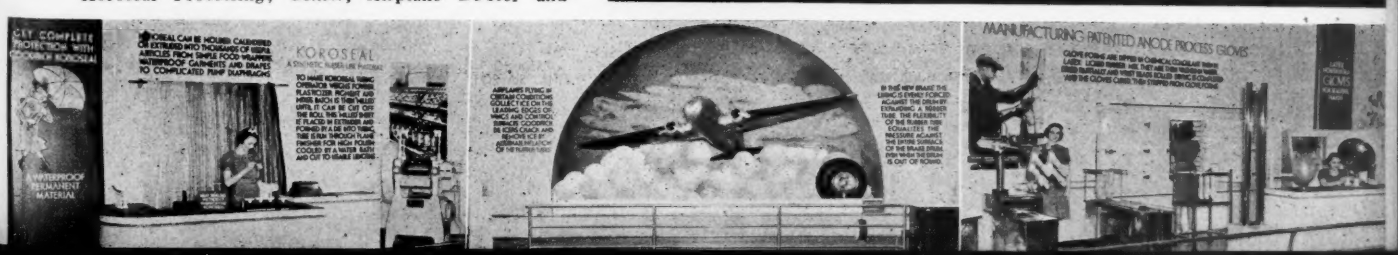
A separate theatre in which du Pont presents a large puppet show is covered with Velvetex rubber carpeting. It is anticipated that at least 5,000,000 people will walk over the carpet before the fair closes to test its wearing qualities. Du Pont's rubberized upholstery fabric, Cavalon, is utilized by 100 of the fair's buses. Nylon textile fibers and different types of plastics are among the many other du Pont displays.

United States Rubber's "Lastex" exhibit covers 1,300 square feet in the Consumer's Build-

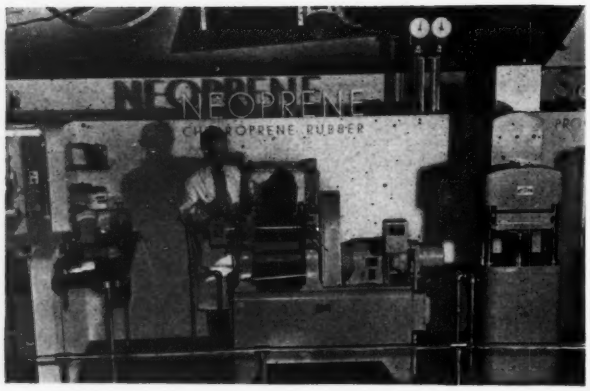
Underwood & Underwood

U. S. Rubber—"Lastex" Apparel

Goodrich—(*Right*) Proving Tires; (*Below*) *Left*, Brake; *Right*, Anode Glove Production


GET COMPLETE PROTECTION WITH GOODRICH KOROSEAL
A WATERPROOF PERMANENT MATERIAL
KOROSEAL
MANUFACTURING PATENTED ANODE PROCESS GLOVES

Koroseal Processing; *Center*, Airplane De-Icer and



Du Pont—Neoprene Processing

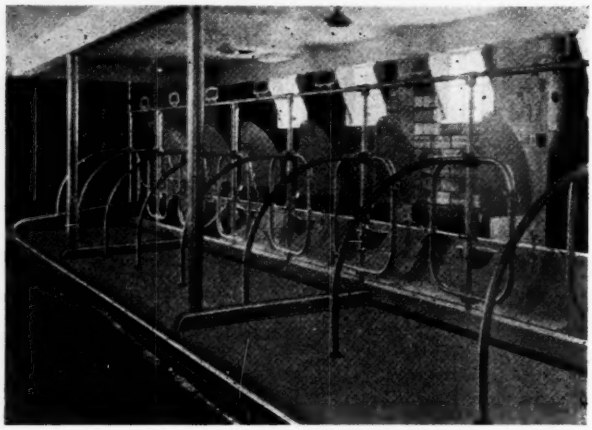
ing. A graphic presentation of the fashions of tomorrow as seen in stretchable apparel is the feature of this exhibit. All types of "Lastex" apparel and accessories for men, women, and children are shown on life-sized mannequins; while small mechanical mannequins parade smart ensembles in a miniature theatre of fashion. In the Home Furnishings building, the new "U. S." Royal Foam Sponge mattresses and cushions are on display with actual installations of this material as it is used in buses, trains, and planes. Demonstration units will provide visitors with an opportunity for testing sponge cushions and mattresses for comfort.

Foreign and Miscellaneous Exhibits

Plantations activities are pictured in both the British and Dutch colonial exhibits. In the British Malayan exhibit a small diorama shows the collection of latex on a rubber plantation, and the Netherland India display includes a small-scale model of a typical Sumatran rubber estate and an actual-size model of a native tapping a rubber tree. Realism is added to the exhibit by the presence of natives working at their handicrafts.

On display in the French Pavilion is a three-unit lightweight railway car equipped with pneumatic tires. An exhibit of the submarine cable industry in the British Pavilion shows sample lengths of various undersea cables, gutta percha leaves and blocks, balata, and other cable materials. The Societa Italiana Pirelli has a show case of products in the Italian Pavilion which includes a giant airplane tire, gas mask, large diameter hose, and section of a cable. Airplane and automobile tires made of artificial rubber from potatoes are displayed in the Polska Opona Stomil tire exhibit in the Polish Pavilion. Visitors to the Belgium Building walk over a resilient floor covering consisting of a top layer of sheet rubber bonded to a sponge rubber backing.

Rubber-covered cow beds and calf pens are an important feature at "The Electrified Farm of the Electric Utility Industry." The beds, products of the Humane Dairy Specialty Co., utilize sheet rubber, ¼- to $^{5}/_{16}$-inch thick with a single-ply fabric reenforcement. The sheet is held in place by steel reenforced retainer strips attached



Electrified Farm—Rubber Cow-Bed

to the concrete by means of expanding plugs. In the Hall of Science, National Automotive Fibres, Inc., displays automotive upholstery fabrics with embossed designs obtained by molding rubber into the back side. The floor of the display booth is covered with a new-type matting consisting of loose fibers firmly bonded to a sponge rubber backing. A large diorama in the Beech Nut Building shows a jungle scene of the gathering of chicle for chewing gum; while in this same building a life-sized animated rubber baby may be seen as a part of a spinach display. Among the many products X-rayed in an industrial inspection unit of the General Electric Building are a section of an automobile tire, a rubber heel, and golf balls.

In addition to its own prominent role at the fair rubber has contributed measurably to the building of the fair itself. A unique example of rubber's application was in the casting of the twelve phenolic statues, seen in the rotunda of the Federal Building. The statues, 9½ feet high and said to represent the largest monolithic resin castings ever made successfully, were cast in latex-rubber molds.

Aqueous Dispersions

(*Continued from page* 36)

ditions when an interruption of shipping facilities would seriously affect the procurement of crude rubber and latex.

The Dispersites that are made from reclaimed rubber, even the fully compounded and vulcanizing types, are generally lower in price than other forms of aqueous dispersions of rubber. Furthermore their price structure is relatively stable and does not follow the wide fluctuations of the crude rubber market, an important factor to the manufacturer who finds it difficult to pass on to his customers his variations in price of basic raw materials that go into the make-up of his products.

Romantic Research

(*Continued from page* 39)

giving no evidence of a black coke, gray limestone, white salt ancestry. These can be heat sealed and lend themselves to any packaging or wrapping need as well as to novelty draperies, raincoats, and coverings.

The men who have developed the wide variety of present uses of Koroseal under the capable direction of Dr. Frank Schoenfeld pretend, at least, to be very casual about the things they have accomplished, amazing though they may be to the layman. Perhaps the pose that masks their enthusiasm is justified, especially, if, as they believe, they have only started to touch on possible uses of Koroseal.

Isolac[1]

ISOLAC is a thermoplastic derivative of crude rubber having balata-like properties, which can be added to rubber compositions requiring unusual toughness and stiffness at normal temperatures. Hard and boardy at room temperatures, Isolac softens readily at elevated temperatures. It has a characteristic odor, a distinct taste, and a specific gravity of 1.015; it is dark mahogany in color. Requiring half as much sulphur as crude rubber, Isolac will cure alone or with crude rubber at normal rubber curing temperatures.

Isolac is available in two grades called Standard Isolac and Isolac XX which differ only in degree of treatment and, therefore, in softening point. Standard Isolac softens to a good milling condition at 60° to 70° C. and Isolac XX at 80° to 90° C. Both Standard and XX Isolacs may be made from smoked sheets or pale crepe and are designated as Isolac S or P and Isolac XXS or XXP depending on the rubber used.

General Characteristics

Although Isolac will not adhere to unvulcanized rubber even when pressed together and although low viscosity cements containing both rubber and Isolac separate after standing, it can be incorporated into rubber in all proportions by mixing on a hot mill, probably functioning in much the same manner as a filler.

Standard Isolac and rubber are best mixed together by first warming the Isolac in a hot room until it is flexible and then working on a mill heated to 70° C. for a few minutes. The crude rubber, previously broken down and while still hot, is then added, and the mixture blended. Because of the elevated temperature necessary to produce a uniform blend, it is often desirable to use this material in the form of a 33/67 Isolac and rubber masterbatch in order to prevent scorching of the final batch. However, if the sulphur is added later on a cool mill, this precaution is of no consequence.

Owing to the higher softening point of Isolac XX, it is slightly more difficult to disperse in rubber than is Standard Isolac. In this case also a masterbatch containing 33 parts of Isolac XX and 67 parts of rubber may be prepared. The pre-warmed Isolac may be placed on a hot mill (approximately 90° C.) equipped with a scraper or in a hot Banbury with hot, broken down rubber. These materials are blended thoroughly and then scraped off the hot mill rolls, or, if the batch sticks in the Banbury mixing chamber, approximately one-half gallon of cold water should be added, mixed for one-half minute, and dumped.

The properties of Isolac do not change during storage, and it does not affect the aging characteristics of rubber compositions containing it. Mixtures of rubber and Isolac, being thermoplastic and having high permanent set, do not crack on exposure to ozone. At room temperature thin films of Standard Isolac are flexible and can be extended slightly, but do not have an appreciable recovery. Isolac XX is almost brittle in thin sheets at room temperature. In thick films both types of Isolac are brittle and can be shattered with a sharp blow. Blending Isolac with rubber produces a composition that is flexible at room temperature. The color of Standard Isolac is darker than that of the crude rubber from which it is made, and Isolac XX is somewhat darker than Standard Isolac. However the pigmenting effect of Isolac made from pale crepe does not prevent its being used in white Isolac-rubber compounds.

Isolac is soluble in the usual rubber solvents, petroleums, chlorinated hydrocarbons, and aromatics, but is not soluble in the ketones, ethers, or alcohols. Practical cements usually contain from 25 to 40% of Isolac by weight. Low viscosity cements are obtained by incorporating during the solution period 0.05 to 0.1% (on the Isolac content) of a soluble organic base such as piperidine or dibutylamine.

Compounding Characteristics

Isolac provides stiffness and boardiness without the use of excessive pigment loading and large amounts of thermoplastic softeners, as is shown in Tables 1, 2, 3, and 4. In most compositions from 30 to 50% of Isolac on the crude rubber content is considered to be proper.

The effect of Isolac on the stiffness and hardness of an unloaded stock is shown in Compounds Nos. 721-48 and -50 (Table 1) which reach maximum physical properties at a cure of five minutes at 316° F. High accelerator and sulphur ratios have been used in the basic rubber stock because they are necessary when those ingredients are added which are required for stiffness and hardness and which have a retarding effect on cure. Such compounds are shown in Tables 2, 3, and 4 in which maximum physical properties are obtained in 15 minutes at 316° F.

TABLE 1. ISOLAC IN AN UNLOADED COMPOUND

Compound No. 721	-48	-50
Smoked Sheets	100.	100.
Isolac Standard	—	50.
Zinc Oxide	10.	10.
Stearic Acid	1.5	1.5
Neozone A	1.5	1.5
Zenite	1.5	1.5
D. O. T. G.	0.5	0.5
Sulphur	4.	4.
Cure: 5 minutes at 316° F.		
*Modulus at 300%	525	1625
*Tensile strength	3600	3675
*Elongation at break	580	540
*Hardness at room temperature	53	73

It is apparent from the data in Table 1 that a hard, stiff compound can be obtained by adding Isolac to a gum stock without other loading and with no decrease in tensile strength and only slightly lower elongation.

Table 2 shows data on a heavily loaded all-rubber stock containing 20 parts each of Montan wax and glue and one similarly loaded, but containing 30 parts of Standard Isolac in place of the wax and glue. The rubber stock, Compound No. 721-37, is a typical "no-mark" sole compound and was selected for this comparison because with such high loading of clay and magnesium carbonate, Montan wax and glue, which are soft at processing temperatures, give good processing properties and also the "dead" stiffness at room temperature that is desired. It would be expected that the substitution of Isolac, which is thermoplastic, for Montan wax and glue would impart the same properties, but, being a rubber derivative, would offer

[1] Abstracted from Report No. 39-1, "Hard Rubber Compounding," by H. G. Bimmerman, and Report No. 39-2, "Isolac," by A. J. Northam, E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Division, Wilmington, Del.

other advantages. It will be noted that the data for modulus, tensile strength, and hardness are only very slightly higher for the Isolac stock (721-56) than for the rubber stock (721-37). The hardness figures are interesting in that the stock containing Isolac has softened much less at 70° C. than the rubber stock containing Montan wax and glue.

TABLE 2. ISOLAC VS. MONTAN WAX AND GLUE IN A HEAVILY LOADED STOCK

Compound No. 721	-37	-56
Smoked Sheets	100.	100.
Isolac Standard	—	30.
Zinc Oxide	10.	10.
Clay	150.	150.
Magnesium Carbonate	40.	40.
Stearic Acid	1.5	1.5
Montan Wax	20.	—
Glue	20.	—
Neozone A	1.5	1.5
Zenite	1.5	1.5
D. O. T. G.	0.5	0.5
Sulphur	4.	4.
Cure: 15 minutes at 316° F.		
Modulus at 200%*	1025	1200
Tensile strength	1325	1375
Elongation at break	330	250
Hardness at room temperature	88	93
Hardness at 70° C.	78	89

*Throughout this report tensile strength and modulus at intermediate elongations are expressed in English units (lbs. per sq. in.). Elongation at break is recorded as a percentage of the original length. Hardness is reported in terms of Shore Durometer Type A readings.

Table 3 compares Standard Isolac with Isolac XX in a base compound containing 150 parts of clay. The base compound is similar to that used in Table 2 except that the magnesium carbonate has been omitted and the amount of accelerator increased slightly. It will be noted that the data for modulus, tensile strength, and elongation on Compound No. 721-107, which contains Standard Isolac, are higher than those for Compound No. 721-104, which contains Isolac XX. The most important difference, however, lies in the hardness figures taken at room temperature, 70° C. and 100° C. The greater hardness of the Isolac XX stock at these several temperatures would be expected since the material itself softens at a higher temperature than Standard Isolac. Generally speaking, Standard Isolac is suitable for service at normal temperatures and Isolac XX for service where elevated temperatures and mechanical pressure prevail.

TABLE 3. STANDARD ISOLAC VS. ISOLAC XX

Compound No. 721	-107	-104
Smoked Sheets	100.	100.
Isolac Standard	30.	—
Isolac XX	—	30.
Zinc Oxide	10.	10.
Clay	150.	150.
Stearic Acid	1.5	1.5
Neozone A	1.5	1.5
Zenite	1.5	1.5
D. O. T. G.	0.75	0.75
Sulphur	4.	4.
Cure: 15 minutes at 316° F.		
Modulus at 200%	1750	1550
Tensile strength	2125	1850
Elongation at break	340	280
Hardness at room temperature	87	93
Hardness at 70° C.	78	88
Hardness at 100° C.	67	80

When properly pigmented, good, hard white stocks can be made with Isolac, as shown in Table 4.

Isolac may be used to advantage in so-called "hard" rubber because much better colors can be obtained in such mixtures than are possible in ebonite. A type of semi-hard material may be colored economically to produce light pastel and strong mass-tone colors. A formula for such a material is shown in Table 5.

Small disks made from this material may be cured in 30 minutes at 60 pounds' steam pressure (307° F.), giving a durometer hardness of 98. Although not a true hard rubber, this material may find specialized uses where the short cure, bright color, and freedom from shrinking during cure make its use attractive.

TABLE 4. WHITE STOCKS

Compound No. 721	-85	-86
Pale Crepe	100.	100.
Isolac Standard	50.	30.
Zinc Oxide	10.	10.
Fine Particle Size Whiting	75.	—
Titanium Dioxide	40.	40.
Du Pont Rubber Blue GD	0.02	0.03125
Glue	—	10.
Magnesium Carbonate	—	40.
Clay	—	75.
Stearic Acid	1.5	1.5
Hard Cumar	—	5.
Solux	0.25	0.25
Zenite	1.25	1.25
D. O. T. G.	0.25	0.25
Sulphur	4.	4.
Cure: 15 minutes at 316° F.		
Modulus at 200%	1050	925
Tensile strength	1775	1425
Elongation at break	430	360
Hardness at room temperature	90	91

TABLE 5. ISOLAC IN SEMI-HARD RUBBER

Compound No. 626	-11
Pale Crepe	100.
Zinc Oxide	10.
Clay	160.
Magnesium Carbonate	50.
Lithopone	50.
Du Pont Rubber Red PBE	4.
Isolac XX-P	50.
Stearic Acid	1.5
Solux	0.25
Zenite	1.75
Di-ortho-tolylguanidine	0.25
Sulphur	5.

Applications

It is obvious that the properties of Isolac make it suitable as a balata substitute, in part at least, in balata-rubber compositions. An important application is in shoe soles and top lifts which require the toughness, "dead" hardness, and good abrasion resistance that Isolac provides. It is characteristic of Isolac soles and top lifts to wear away smoothly and slowly in service with no slivering or laminating as often occurs in all-rubber soles and top lifts. Another use for Isolac-rubber stocks is in coated fabrics for school bags, play balls, and some types of shoe fabrics where hard, stiff materials that will not crack on bending are desirable. In insulated wire, Isolac-rubber compositions may serve for jackets due to the ozone resistance and to the unique physical properties Isolac provides.

Nylon Patents Issued

FOUR patents for hosiery and other knitted fabrics made of Nylon, the new organic textile fiber derived basically from coal, water, and air, were issued to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., on May 9. The patents set forth that Nylon has great elasticity, strength, and wearing qualities; that it presents an excellent appearance; that it is virtually wrinkle free; that it dries extremely rapidly after laundering; and that stockings made of it may be washed repeatedly without material change in their original shape and smooth characteristics. The patents cover the use of polyamide yarn for stockings, pre-boarding of stockings, setting yarns, and fabrics, and the use of sodium sulphite for setting.

At present Nylon is being marketed commercially as tooth brush bristles, under the trade name "Exton," and for sewing thread, fishing lines, and fishing leaders. Experimentally it shows promise for hosiery, knit goods, other textile products, and even products differing widely from textiles. Although at the present time Nylon does not appear to have application in the rubber industry, future commercialization may involve its use for impregnated or coated fabrics or even other unexpected applications.

Continuous Vulcanization of Belting[1]

John M. Bierer and T. M. Knowland[2]

FROM the earliest days of the rubber industry it has been realized that a rubber product of uniform quality can be made only by vulcanizing it as a complete unit in one step or by some continuous process. When an article is relatively small, there is little difficulty in vulcanizing it in one step, irrespective of its shape, structure, or composition. On the other hand, when an individual product is very large, and especially when it is very long, it usually has to be vulcanized piecemeal. When a large article, such as a rubber belt, is vulcanized one section after another, mechanical weaknesses and chemical instability of the overcured rubber are introduced. In spite of the fact that the faults of intermittent vulcanization have long been recognized by rubber technologists, the development of machinery and mechanical equipment has, in general, failed to keep pace with developments in compounding. This situation can be attributed to the fact that the development of machines has remained to a great extent in the hands of machinery manufacturers, who, in spite of a willingness to make improvements, have been handicapped by insufficient encouragement and support from the rubber manufacturers.

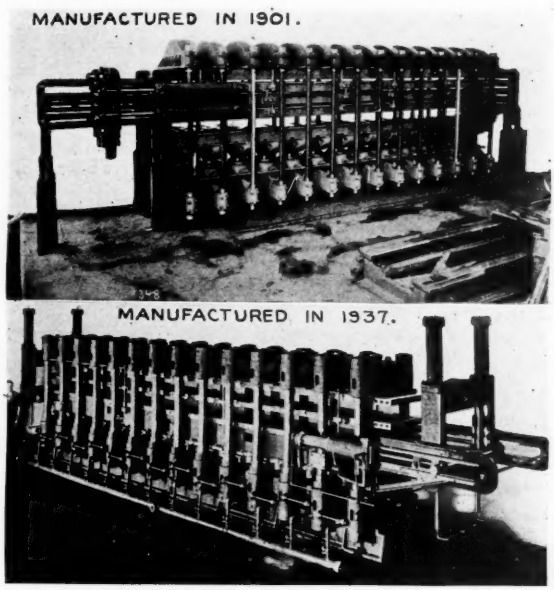


Fig. 1. Insignificant Improvements Made in the Platen-Press Method of Vulcanizing Belting in 36 Years

"Continuous vulcanization" means any process whereby a rubber product, no matter how large or how long, is vulcanized progressively and uniformly without interruption at any time or at any point in the article. In this respect there have been two important developments, both made by rubber manufacturers: (1) continuous vulcanization of insulated wire, and (2) continuous vulcanization of rubber belting and other mechanical goods.

The first is being used with success industrially, but since it is an adaptation of a very old patent and has been well described in the literature, it will not be discussed here. The second development, the continuous vulcanization of mechanical rubber goods, with particular reference to belting, is the subject of the present paper.

Historical

The improvements which have been made in the platen-press method of vulcanizing belting are only insignificant (Figure 1). These presses, made in 1901 and in 1937 by one of the best known manufacturers of rubber machinery in the world, show no worth-while differences in principles of construction.

A study of the patent literature of different countries brings to light various attempts to vulcanize mechanical rubber products by the continuous method. All these attempts were unsuccessful.

A very early patented machine is shown in Figure 2. In 1859 Parmelee proposed in this patent to vulcanize rubber by passing it over a drum around which was a tension band. Heat was supplied by a fire under the vulcanizing drum. In brief, 80 years ago an inventor realized the harmful effects obtained when a rubber article is not vulcanized continuously.

A machine was patented 56 years ago by Eddy for vulcanizing insulated wire continuously (Figure 2). In effect it is a combination of extruding machine and vulcanizing chamber. In those days there were no rapid accelerators, and curing was relatively slow. Since that time the speed of vulcanization has been increased tremendously and the mechanical faults of the early machine have been overcome.

In 1903 Gray in England obtained a patent for vulcanizing flat rubber articles continuously. His machine (Figure 2) is a notable improvement over the earlier one of Parmelee. However, in spite of the fact that the Gray machine was designed by an executive of a large, progressive rubber factory and was actually constructed, the machine has rested for over 30 years in the department where it was installed and has never produced any significant quantity of rubber goods.

Belt Making with Platen Presses

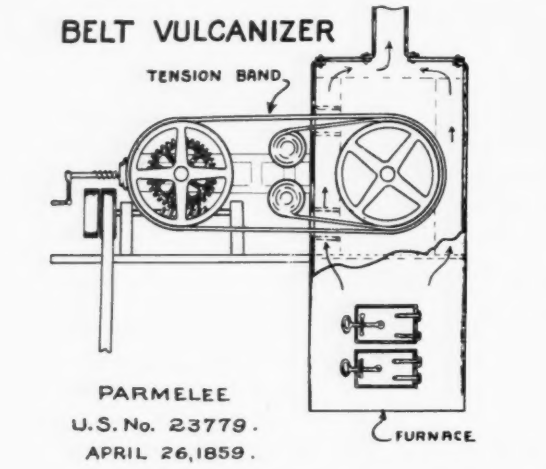
Rubber belting is really a laminated structure of rubberized duck, cord, etc.; and serious disadvantages have persisted to the present day in its manufacture in platen presses in spite of numerous schemes and devices which have been conceived to overcome these features. From

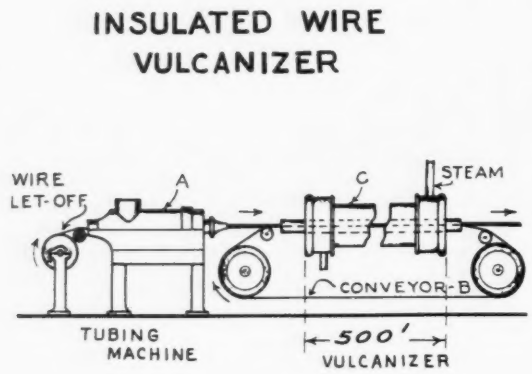
[1] Presented before the Division of Rubber Chemistry, A. C. S., at the Baltimore meeting, April 3 to 7, 1939, and by special permission published concurrently with the June 1, Indus. Ed., *Ind. Eng. Chem.*

[2] Boston Woven Hose & Rubber Co., Cambridge, Mass.

the compounding point of view, antioxidants and organic accelerators which give "flat cures" have aided greatly; also water-cooled ends on the platens have improved conditions. But even with these developments, belts subjected to severe conditions in service frequently break or fail at the press overlap.

Figure 3 shows a belt with a press overlap which failed in oil field pumper service. A survey made in the oil fields, where the service is severe, showed that this has been





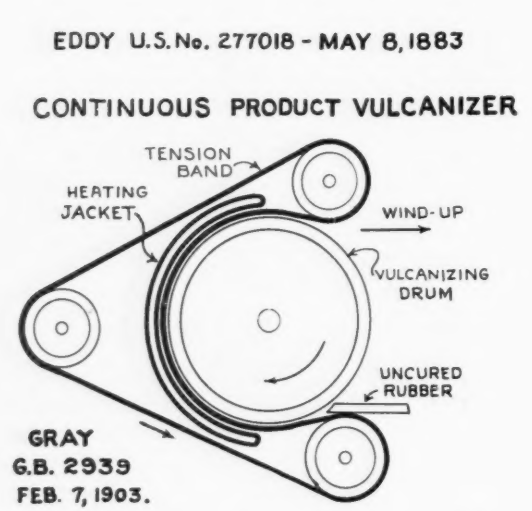


Fig. 2. Three Early Attempts at Continuous Vulcanization of Rubber Products

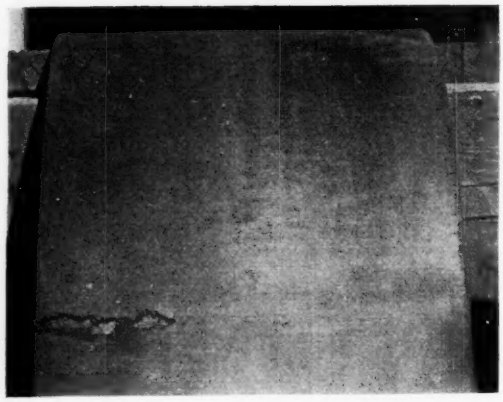


Fig. 3. Broken Press Overlap of a Belt Used in an Oil Field

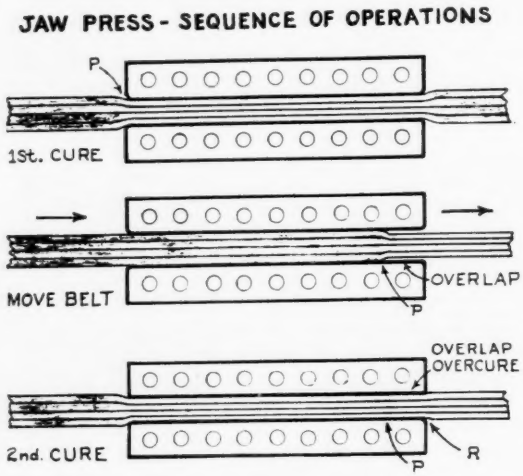


Fig. 4

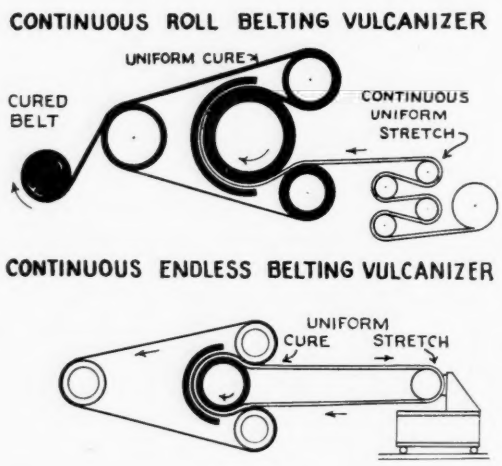


Fig. 5

a frequent cause of failure in belts from every manufacturer. The reason for choosing oil fields as an illustration is that, within a small geographical area, belts of various manufacturers on difficult drives are more readily accessible than in any other field of operation.

The break shown in Figure 3 is to some extent a result of overcuring at the press overlap, but it is to a much greater extent a result of folding of the duck. All belting

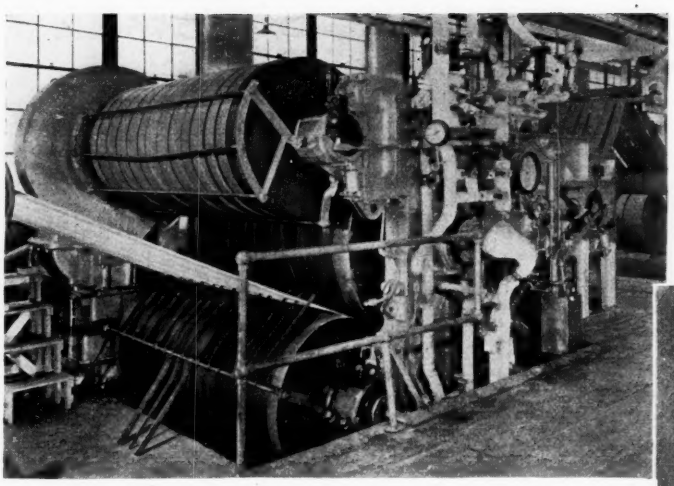


Fig. 6. Transmission Belt Entering a Rotary Vulcanizer

is compressed about 25% when it is vulcanized, as Figure 4 indicates. Here, outside of the platens, the thicker, still uncompressed section of the belt is clearly seen. When the

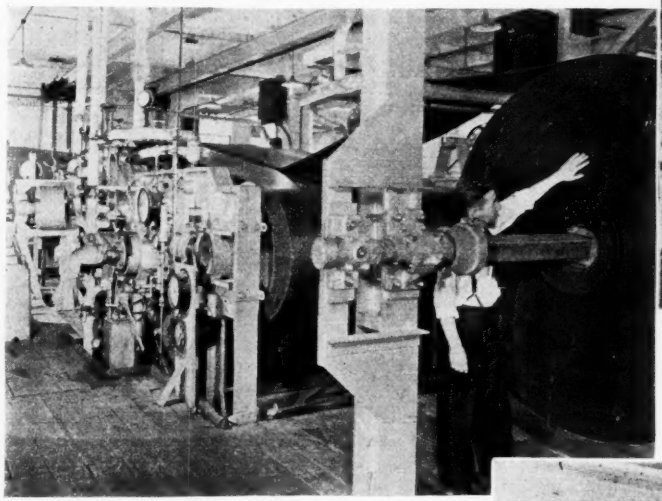


Fig. 8. Conveyer Belt Leaving the Continuous Vulcanizer

first section has been vulcanized and this junction of thicker and thinner sections is again vulcanized, the duck at this junction is distorted, badly strained, and consequently weakened.

Another frequent way by which transmission belts break down is what is known as "bootlegging"—that is, separation of the plies resulting from continued stresses during flexing. By the development of superior rubber stocks—for instance, by the use of accelerators which minimize the harmful effect of double vulcanization at the end of a platen press—the evil effects of double curing at press ends can be reduced. Nevertheless, tests of belts made by prominent manufacturers show differences of 10 to 40% between the flexing life of the normal parts and the press overlaps of these belts. One manufacturer considers overcuring at the ends of the presses to be so serious that he deliberately undercures the body of his belts in such a way that the press overlaps are properly cured after the double vulcanization. In other words, when this manufacturer sells belting, he sells 29.5 feet of undercured and substandard quality and only 6 inches of good quality.

Press overlaps in conveyer belting are even more serious than in transmission belting. The bad effects on the fabric and on the tendency to "bootleg" are equally serious, but in addition

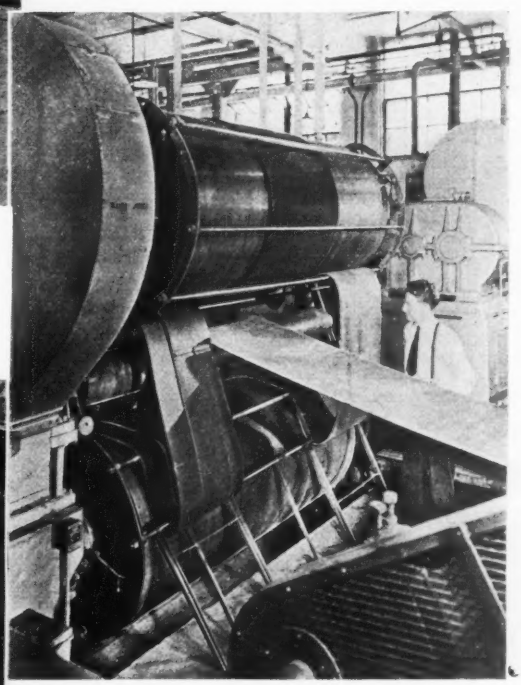


Fig. 7. Conveyer Belt Entering a Continuous Vulcanizer

the overcured part of the cover is likely to blister, and resistance to abrasion is lowered by the double cure.

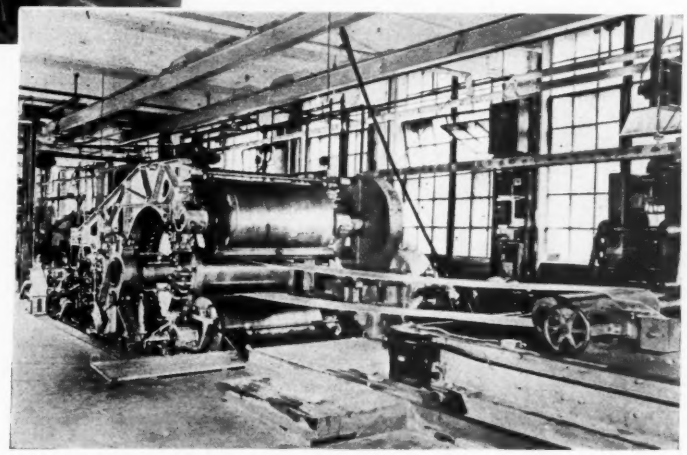


Fig. 9. Large Belt Being Vulcanized in an Endless-Belt Press

New Developments

Although the earlier machines for continuous vulcan-

ization gave promising results with some types of thin, flat construction, no satisfactory belts have ever been made commercially until recently. The earlier machines did not produce commercially satisfactory belts because they could not be operated under sufficient pressure to give the proper density or compactness of structure to the finished belting, or were they prestretched. During the last seven years all these problems have been solved in a machine which is now commercially successful. Figure 5 shows the operation of this machine.

In developing it, no commercial steel could be found of sufficiently high tensile strength to allow the application of pressures high enough to compress the belting to the proper degree. Furthermore, if more strength were to be obtained by increasing the thickness of the band, greater stresses would be set up when the band was bent over the drum and the increased strength would be nullified. Then again, an increase in diameter of the drum would necessitate more tension on the band to compress the belt to a given degree. But it was found that when the belt was first heated and pressure was then applied to compress it to the desired thickness, a steel band of sufficient strength to keep the belt compressed during vulcanization could be secured. The installation and successful operation of a band of this type led to the production of the first sufficiently compact belt ever made on a continuous vulcanizing machine.

Steel can be rolled in sheets over ten feet wide, but its quality is wholly unsatisfactory for a vulcanizing tension band. The task was, therefore, to obtain a steel band sufficiently wide and strong to be used for wide belts, particularly conveyer belts. The problem was successfully solved by fabricating a band from narrow, high-tensile strips of steel.

The next problem was to connect the vulcanizing machine directly to a continuous stretching device, whereby the stretch of the belt could be maintained at a predetermined percentage and could also be changed at will by a regulating mechanism. This also was a serious mechanical problem, but the design of mechanism finally developed has given satisfactory operation ever since. The principle of vulcanizing endless belts is the same as that for roll belting; only the method of stretching is different.

Finally the problem of making square-edge rubber-covered conveyer belts involved many mechanical problems, the details of which are irrelevant to the present discussion.

Present developments and the operation of rotary belt vulcanizers are indicated by Figures 6 to 9. Figure 6 shows a transmission belt going into a rotary vulcanizer and coming out vulcanized. Figures 7 and 8 show a conveyer belt entering a continuous vulcanizer and coming out vulcanized. In Figure 9 a large endless belt is being vulcanized in an endless-belt press.

The largest endless belt manufactured by the new method is 52 inches wide and 248 feet long. It is believed that this is the largest truly endless conveyer belt which has ever been made. Many larger conveyer belts have been made endless on the job by a step-splice, but this reduces the strength and the quality of the belts.

The new type of machine for the continuous vulcanization of belting saves steam and hydraulic power. It eliminates the human factor and makes the vulcanization of belts one of the more pleasant and less difficult operations in a mechanical rubber goods plant. The operation of a platen press is hard work and in hot weather is objectionable; in fact, it is one of the most difficult jobs in a rubber factory.

Distributers' Stocks

(*Continued from page* 40)

holding 548,479 casings, against 15,549 outlets and 544,327 casings on January 1; hence those firms serviced an increasing number of outlets with lower average stocks per outlet.

REPORTED COMPARATIVE STOCKS

	January 1, 1939	April 1, 1939
Number of Firms	42	42
Casings	1,071,100	1,005,827
Inner Tubes	1,012,368	948,815
Index Numbers:		
Casings	111.4	104.5
Tubes	105.0	98.6

Other Mass Distributers' Reported Stocks

Reports were received from six tire manufacturers operating 2,150 (2,137 January) retail stores and carrying stocks held in these outlets, and from seven other mass distributers operating 1,896 stores (1,869 January) and covering their total stocks on hand as of April 1. Stocks reported here by manufacturers are presumably mostly also included in manufacturers' inventory as reported by the Rubber Manufacturers Association, Inc. A reduction in stocks of inner tubes in manufacturer-operated stores was reported, but stocks of casings were increased by both groups of firms. Returns under this heading are considered so nearly complete as to require no adjustment in the summary estimates, where January 1, 1939, figures have been revised.

REPORTED COMPARATIVE STOCKS

	January 1, 1939	April 1, 1939 (including late returns)
Number of Firms	13	13
Number of Stores	4,006	4,046
Casings	1,920,334	2,019,446
Inner Tubes	1,599,006	1,556,414

Stocks of New York Dealers

The following tabulation covers stocks reported by dealers in New York State, including reports received through cooperation of the Greater New York Tire & Battery Association. An increase in stocks of both casings and inner tubes during the first quarter is shown by comparative reports from 100 firms operating 144 stores April 1, against 167 stores January 1. This state accounted for 8.1% of the casings and 9.4% of the inner tubes reported by dealers in the current survey. A declining ratio of inner tubes to casings is shown in the returns of dealers holding over 500 casings each, but an increasing ratio for the smaller dealers.

	April 1, 1939 Number of		January 1, 1939		April 1, 1939	
Casings	Dealers	Stores	Casings	Tubes	Casings	Tubes
Under 200	62	70	6,502	6,730	5,492	7,185
200-500	20	48	6,879	8,314	6,953	9,734
Over 500	18	26	11,911	19,311	15,250	21,868
Total	100	144	25,292	34,355	27,695	38,787
Other April	19	19			13,426	16,276
Total April	119	163			41,121	55,063

Acknowledgment

The support of the Rubber Manufacturers Association, Inc., the assistance of the National Association of Independent Tire Dealers, and the cooperation and promptness of dealers, oil company distributers, manufacturers and other mass distributers, in submitting data used in this report is gratefully acknowledged.

Synthetic Rubber and Felt

Herman Boxser [1]

THE development of oil resistant synthetic rubbers has been welcomed by the felt manufacturer, as an assistant not only to present felt applications, but also to the enlargement of new possible sources for applications of felt-synthetic rubber combinations.

Pressed felt of various densities, cut in washer form or as wicks, is used in all industries where oil retention, grease sealing, or dust exclusion are sought. It was, therefore, natural that the resilient synthetic rubbers with their added strength and oil resistance should find themselves as adjuncts to felt products.

The synthetic rubbers which have been used to the greatest extent are Neoprene and "Thiokol." Varied compounds of these are milled and calendered to various gages, mostly 1/32-inch in thickness. The calendered stock is then run between layers of felt, following which operation the whole mass is re-calendered to complete the lamination of the uncured stock. The vulcanization is completed in hydraulic presses.

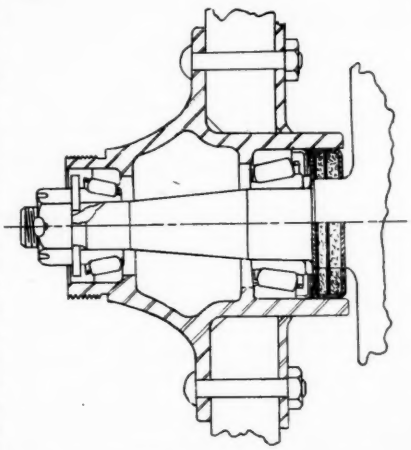


Fig. 2. **Front Wheel Assembly Showing Installed Gasket**

The numbers of layers of felt and Neoprene will vary as Figure 1 shows, the structure depending upon the ultimate application of the finished product. The illustration depicts (a) Neoprene center and two outer layers of felt, (b) three layers of felt and two layers of Neoprene, (c) two layers of felt and two layers of Neoprene.

The type of lamination which finds the largest application is the one consisting of two layers of felt and two layers of Neoprene (c), i.e., a bottom layer of felt, a center layer of Neoprene, superimposed by a second layer of felt having a surface layer of Neoprene upon it. This arrangement has been found to give good grease sealing on a revolving shaft as shown in Figure 2 or as a packing as depicted in Figure 3.

The principle involved here is that the inner layer of Neoprene acts as a sealing medium to prevent the passage of oil, and the inner felt tends to lubricate the shaft to prevent scoring. The center layer of Neoprene serves as a secondary dam against the passage of any oil through the inner layer of Neoprene; while the outer felt layer serves as a dust guard to prevent the passage of any dust or grit from the outside that might produce shaft scoring.

[1] Chief chemist, Western Felt Works, Chicago, Ill.

[2] This product, "Statite," is made by Lubrication Products Co., Cleveland, O.

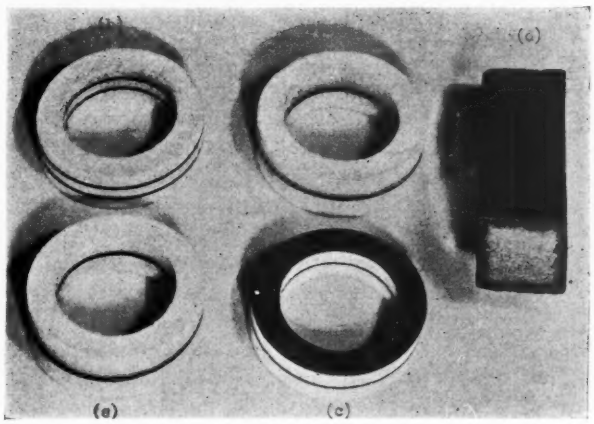


Fig. 1. **Felt and Neoprene Gasket Construction**

Where Neoprene is used on a revolving shaft, it usually necessitates the use of a self-lubricating layer which will produce a minimum amount of friction and hence lowering possibilities for shaft scoring.

The major tests which are carried out to evaluate sheeted Neoprene cured stock are: hardness—(Shore Durometer); hardness after aging (72 hours at 158° F.); elasticity (Penetrometer—before and after aging); compression—aging set; increase in weight and volume after kerosene immersion test.

A few uses of Neoprene felt combinations are shown in the accompanying illustrations. Figure 2 shows the laminated material enclosed in a steel retainer acting as a grease and dust seal on a front wheel truck assembly. The same felt may be used as a packing on a universal ball joint assembly to prevent oil and grease leakage.

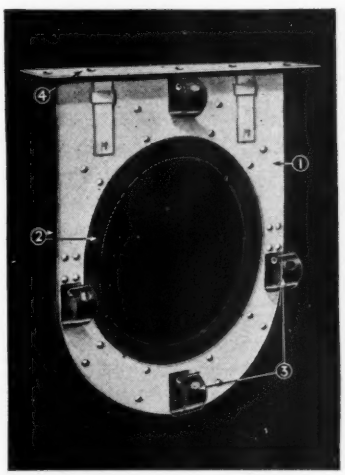


Fig. 3. **Packing for Journal Box on Railway Cars**

In Figure 1 (Part d) is depicted an oilproof packing which may also be utilized as a mounting pad for engines. It consists of an S.A.E. F-2 felt with a complete coating .015-inch thick of Thiokol.

Figure 3 illustrates a journal box packing[2] for use on railway cars, which consists of a laminated gasket (2), made up of two layers of high-grade wool felt vulcanized to a layer of Neoprene. The gasket serves as a close hugging, free sliding collar on the journal to repel water from without and prevent the leakage of oil from the journal box and also to act as a seal against the rough cast-iron surface of the dust guard well.

Editorials

Realism in Labor Relations

SPEAKING before the recent meeting of the American Institute of Chemical Engineers in Akron, Henry G. Baker, Jr., commissioner of conciliation of the U. S. Department of Labor, urged more realism on the part of American industry in its relations with organized labor.

Attributing the relative freedom from dissention in the chemical industry to the fact that its personnel is largely under the supervision and direction of trained engineers, the speaker said, "Engineers deal with facts and have a sound reason for their actions. For this reason the average workman has confidence in the engineer's ability and respects his judgment." He further stated, "If labor and management will each stop distrusting the other and start dealing with mutual problems on a basis of facts and common sense instead of prejudice and emotions, then a start can be made toward better employer-employe relations—and these are essential if American industry expects to progress through better cooperation and coordination among its various units."

Mr. Baker has certainly stated concisely and clearly the proper basis on which harmony and progress can be attained. However it is necessary that a further definition be given and followed for such of his terms as "labor and management . . . mutual problems . . . basis of facts and common sense . . . American industry."

"Labor and management" should be construed to mean those and only those engaged in management and in labor directly related to the particular group or project. To a remarkable degree experience has shown that employes and management of an industrial unit can agree if they are permitted to act without outside influence.

"Mutual problems" signifies difficulties or lack of agreement on points reciprocally pertaining to the two groups directly involved. Whenever a group of employes is called upon by an outside agency to act in collaboration with another group of employes in a controversy with a second management unit or in a struggle between labor factions, the question ceases to be one of reciprocal or mutual interest between management and its employes, but rather one of prejudice and emotion.

The desirable interpretation of "basis of facts and common sense" is the utilization of all facts, not part of them, with full consideration for the opinions of the other group in a spirit of reasonable appraisal of the ultimately possible results.

Both labor and management are essential parts of "American industry," and each must recognize its dependence on and proportionate relation to the other. While the old time-worn law of self-preservation is still true, industrial and social existence has become so complex that one can preserve oneself only by preserving others, and labor, as well as management, is compelled to recognize the fact that both are parts of American industry.

In view of past tendencies of the federal administration and particularly the Department of Labor through their acquiescence or support of partial policies as exemplified by the activities of the National Labor Relations Board and the recent controversy in the soft coal industry there is a pronounced hollowness to Mr. Baker's statement which presumably emanates from the Department of Labor. The inference from government activities may well be that compromises are expected, but they must be favorable to organized labor.

Emergency Rubber Stocks

THE much discussed barter plan for trading United States government stocks of cotton and wheat for rubber and tin, now appears to be confronted with certain international obstacles. Recently there has been some indication that, should the barter plan fail, the United States government may consider purchasing rubber on the open market for a stock-pile reserve.

In any plan for creating a large scale reserve ample provision must be made for that excess above the normal supply so as to avoid throwing out of balance the proper relation of world consumption to permissible shipments. Restriction of shipments has reduced world stocks, which at the end of February were 582,653 long tons, to approximate a six months' supply. Recent estimates place the U. S. stocks as of April 30 to 190,896 long tons which with an estimated April consumption of 44,166 long tons, indicates a domestic supply for only 4.3 months.

A reserve stock of 100,000 long tons, which would be approximately a two months' domestic supply, would constitute nearly one-sixth of the world stocks and, if bought on the open market, would seriously reduce the available world stocks and disturb the price structure. It is therefore evident that the institution of any such plan should be accompanied by an agreement whereby the International Rubber Regulation Committee would increase the permissibles by a quantity at least equaling the reserve.

S. C. Stillwagon

EDITOR

What the Rubber Chemists Are Doing

Permeability of Neoprene to Gases[1]

T. P. Sager and M. Sucher

A CHARACTERISTIC of Neoprene, less generally known than others, is its relatively low permeability to gases. The most suggestive utilization of this property is in the construction of various forms of gas containers for use in lighter-than-air craft, particularly since Neoprene may be readily applied to cloth as a continuous film having elastic extensibility. Since rubber is the material which has been employed to the greatest extent for gas containers, it is used as the basis of comparison in the present study. Aside from its practical application, the behavior of Neoprene toward gases is of interest because of the relation of its chemical composition to that of other dienes which possess elasticity.

Neoprene Type E was employed throughout this work. Both Neoprene and rubber compounds were prepared by mastication and compounded on a typical rubber mill. The compounds, thinly sheeted, were dissolved in toluol, and the cements obtained were filtered through cloth. Coated fabrics were prepared by applying a plurality of thin coats to a balloon cloth by means of a small spreading machine equipped with a doctor blade. Unsupported films were prepared in the same manner except that the base was uncoated Cellophane from which the films, after being cured, could be readily stripped. Curing in all cases was effected in dry heat. Permeability was determined by means of a gas interferometer of the Rayleigh type.

Results from a series of experiments on the permeability of unsupported films disclosed that: the specific permeability of Neoprene to hydrogen, helium, and carbon dioxide at 25° C. is shown to be about one-fifth to one-sixth that of rubber; the rate of permeation is inversely proportional to the thickness of film; the increase in the rate of permeation of hydrogen with temperature is exponential since, when log permeability is plotted against reciprocal of absolute temperature, straight lines are obtained.

The balloon cloth used in the coated fabric experiments was a closely woven cotton fabric weighing 2.05 ounces per square yard and having a thread count of 120 in both warp and filling directions. With weights of coatings in the neighborhood of two ounces per square yard, the greatest impedance for a unit weight of coating is obtained in both the case of Neoprene and rubber. The specific gravity of the rubber compound used was approximately 1.0; while that of the Neoprene compound was between 1.3 and 1.4. Based on the weight of the materials, the permeability of Neoprene is about one-third to one-fourth that of rubber. In comparing the permeabilities of Neoprene-coated fabrics with those of unsupported films, it is found that the cloth makes a definite contribution to the gas impedance of a coated fabric.

A study of the effect of the addition of various types of compounding ingredients to the Neoprene coating compound showed that: the inclusion of moderate amounts of orthodox compounding ingredients does not appreciably affect the rate of permeation; compounds containing spermaceti gave the lowest permeabilities; and aluminum powder can be used in fairly large amounts without seriously impairing the permeability, a fact of value because of the high reflecting power and opacity of this pigment. While no advantage was gained from including paraffin wax in the coating compositions, its employment as a supplementary coating was shown to lower the permeability decidedly.

The use of highly volatile solvents in spreading cements tends to produce pinholes. Toluol or its equivalent appears to be the most satisfactory solvent for this purpose.

[1] Abstracted from *J. Research Natl. Bureau Standards*, Jan., 1939, pp. 71-79.

A.S.T.M. Meeting

THE forty-second annual meeting of American Society for Testing Materials will be held at Chalfonte-Haddon Hall, Atlantic City, N. J., from June 26 to 30. Committee D-11 on Rubber Products will meet on Wednesday morning, June 28, and Chairman O. M. Hayden in his annual report will present a number of recommendations on work accomplished during the year and a summary of new projects under way or contemplated. Two papers will be presented by F. L. Yerzley, E. I. du Pont de Nemours & Co., Inc., on the subjects, "A New Oscillograph for Routine Tests of Rubber and Rubber-Like Materials" and "Properties of Rubber Revealed by Mechanical Tests." Committee D-13 on Textile Materials will meet June 28 in the afternoon.

Rubber Division News

Los Angeles Group

ONE HUNDRED AND TEN members and guests attended the monthly meeting of the Los Angeles Group, Rubber Division, A.C.S., held at the Mayfair Hotel, Los Angeles, Calif., May 2. The meeting was sponsored by the Kirkhill Rubber Co., with President T. Kirk Hill the principal speaker. He spoke on his recent trip to South America and illustrated his talk with a motion picture. This was followed by color movies showing operations in the Kirkhill factory. Judge LeRoy Dawson, a friend of Mr. Hill, next entertained the group with many amusing anecdotes relating to his work. A special entertainment feature of the evening was provided by a lady magician.

Table favors, shower bath hose assemblies, were supplied through the courtesy of Mr. Hill. The door prize, a men's toilet set, donated by G. L. Hillebert, of the L. H. Butcher Co., was won by W. A. Graham, of the W. A. Graham Co. A wallet and key case set, supplied by E. Brazil, of the Blue Star Mines, was won by C. Churchill, of H. Muehlstein Co. The June meeting will be sponsored by the Union Oil Co., and the annual fishing trip will be held in Catalina.

Chicago Group

AT ITS meeting on May 12 at the Hotel Sherman, Chicago, Ill., the Chicago Group, Rubber Division, A.C.S., heard E. W. Schwartz, of the General Electric Co., Bridgeport, Conn., speak on "Some Aspects in the Use of Synthetics as Applied to Electrical Insulation." This paper represented the first announcement by General Electric of the conclusion of the initial part of a program started four years ago to develop insulated wire of higher dielectric strength, but with lower wall thickness. In his paper Mr. Schwartz described the process of manufacture and pointed out the excellent results obtained by this new type of insulated wire. The insulation was described as being practically a pure gum stock with resins such as Marbon and Pliolite used to obtain both the necessary processing characteristics and the required dielectric strength. According to the speaker, materials made by this new process gave results with a thinner wall that more than met all the requirements of the various organ-

izations specifying to the insulated wire industry. Mr. Schwartz showed those present samples of the various types of insulated wire he had described. The group plans to hold its first outing and golf tournament on Friday, June 23.

New York Group

AS ANNOUNCED last month, the New York Group, Rubber Division, A.C.S., will hold its outing on June 10 at the Alps Castle, Preakness, N. J. The committee reports a reduction in the ticket price to $2.75 for paid-up members and $3.75 for non-members and guests. Golfers who plan to tee off before 10 a.m. may use the Preakness Country Club course, the fee being $1.50, but late arrivals must use a nearby public course where the greens fee is $2. In addition to the dinner in the evening and refreshments during the day, a regular luncheon will be served at noon. Motorists to Alps Castle should use Highway 23 out of Newark or Highway 4 which starts on the New Jersey side of George Washington bridge. Both the Erie and Lackawanna railroads have stations in Paterson where a taxi may be taken to the grounds.

Akron Group

THE Akron Group, Rubber Division, A.C.S., will hold its summer outing June 16 at the Silver Lake Country Club. The program for the day includes golf in the afternoon and dinner and prize drawing in the evening.

Boston Group

THE annual outing of the Boston Group, Rubber Division, A.C.S., will be held at the Weston Golf Club, Weston, Mass., on July 14. Golf will begin at noon.

Papers for Centennial

THE Centennial Program Committee and the officers of the Rubber Rivision, A.C.S., desire that the technical sessions which the division will hold during the coming fall meeting in Boston will make up a full two-day program. While the committee solicited certain papers dealing with the various phases of vulcanization to insure a well-rounded program for the symposium on this subject, the published list of papers promised will not require two days for presentation. Accordingly, an invitation is given the entire membership of the division to submit original papers which will present new and outstanding developments dealing with vulcanization or allied subjects pertaining directly or indirectly to vulcanization. These papers will be included with those already announced in the final program of this symposium. If the number of papers received is not sufficient to round out a full two-day program, papers of outstanding quality on subjects other than vulcanization will be accepted. July 14 is the latest date at which papers can be accepted.

Dr. H. I. Cramer, of the University of Akron, gave an illustrated discussion of recent developments in rubber chemistry and technology before the Cleveland Section, A.C.S., April 14, Guild Hall, Cleveland, O.

A. I. C. E. Meets in Akron

TWENTY-TWO scientific papers dealing with the application of rubber and synthetic rubber-like materials and other chemical engineering problems featured the thirty-first semi-annual meeting of the American Institute of Chemical Engineers which attracted about 600 technical men and was held at the Mayflower Hotel, Akron O., from May 15 to 17. Webster N. Jones, president of the Institute and dean of engineering at Carnegie Institute of Technology, Pittsburgh, Pa., presided, and R. P. Dinsmore, of the Goodyear Tire & Rubber Co., Akron, headed the general committee on arrangements; while George Oenslager, of The B. F. Goodrich Co., Akron, acted as honorary chairman. Many others who are prominent in rubber activities served on the various committees.

At the banquet on May 16, Dr. William C. Geer, of Ithaca, N. Y., spoke on "An Appraisal of Charles Goodyear's Discovery." After pointing out that the history of the industry from 1839 to the early 1900s comprised primarily inventions of uses and the organization of corporations, Dr. Geer went on to discuss how the modern chemist has measurably improved upon Goodyear's discovery. The four most important improvements, according to the speaker, were: organic accelerators; reduction in the percentage of sulphur for vulcanization; anti-oxidants; and reenforcing agents. The growth of the industry was pictured in terms of world rubber consumption: 30 long tons in 1825; 2,670 tons in 1860; and 917,378 tons in 1938.

Three papers of interest to the rubber industry were presented at the technical sessions: "Koroseal as an Engineering Material," F. K. Schoenfeld, Goodrich; "Neoprene as a Construction Material for the Chemical Industry," E. R. Bridgwater, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; and "Plioweld in the Chemical Industry," N. E. Kimball and F. H. Manchester, Goodyear.

Plant inspection trips scheduled during the meeting included: Goodyear Tire & Rubber Co.—rubber reclaiming plant, rim manufacturing plant, and sponge rubber plant; Goodyear Zeppelin dock—manufacture of lighter-than-air equipment; Firestone Tire & Rubber Co.—rubber preparation and tire manufacture; The B. F. Goodrich Co.—molded goods, braided hose, belting, tires, and tubes.

Ontario Rubber Division

A MEETING of the Ontario Rubber Division of the Canadian Chemical Association was held at the University of Toronto, Toronto, Canada, on April 20. Officers for the ensuing year were elected as follows: chairman, C. L. Brittain, Gutta Percha & Rubber, Ltd.; secretary-treasurer, L. D. Carver, Dunlop Tire & Rubber Goods, Ltd., program committee, J. C. Howard, Kaufman Rubber Co., Ltd., T. Batty, Firestone Tire & Rubber Co., Ltd., and T. D. Waring, Canadian Tire & Cable Co., Ltd.

Speaking on "Modern Compounding and Processing in the Cable Industry," F. E. Rupert, Monsanto Chemical Co., Rubber Service Division, Akron, O., covered the growth and present extent of the cable industry. He traced the development of specifications, compounding and processing to their present state and discussed present trends in the design of wire products. Mr. Rupert concluded by showing a Western Electric sound film on "Safeguarding the Speechways."

Bibliography

USE OF X-RAY DIFFRACTION EQUIPMENT. *Rubber Age (N. Y.)*, May, 1939, pp. 87-88.

REMOVING STATIC ELECTRICITY. W. C. Glass. *Rubber Age (N. Y.)*, May, 1939, pp. 89-90.

CHARLES GOODYEAR. P. W. Barker. *Rubber Age (N. Y.)*, May, 1939, pp. 91-94. (To be continued.)

KAUTEX—A CORK-RUBBER COMPOSITION. D. H. Forbes, *Rubber Age (N. Y.)*, May, 1939, pp. 95-97.

PROCESSING AND APPLICATIONS OF SYNTHETIC RUBBER. J. G. Anderson, *Trans. Inst. Rubber Ind.*, Feb., 1939, pp. 266-78.

PROBLEMS ARISING WITH SOLID-IN-AIR DISPERSIONS IN THE INDUSTRY. A. E. T. Neale, *Trans. Inst. Rubber Ind.*, Feb., 1939, pp. 279-97.

SAFETY FIRST AND ACCIDENT PREVENTION IN INDUSTRY. R. G. Allsop. *Trans. Inst. Rubber Ind.*, Feb., 1939, pp. 298-314.

ON THE MANUFACTURE OF RUBBER IN EIRE. *Rubber Age (London)*, May, 1939, p. 73.

DIESEL-ENGINED GENERATORS FOR RUBBER PROCESSING. *Rubber Age (London)*, May, 1939, pp. 74-75.

MODERN TIRE MANUFACTURE. Part III. Tire Building Systems. A. Fröhlich, *Rubber Age (London)*, May, 1939, pp. 77, 79, 81, 82. (To be continued.)

THE DEVELOPMENT AND APPLICATION OF CORK AS A COMPOUNDING MATERIAL. D. H. Forbes, *Rubber Age (London)*, May, 1939, pp. 83-85.

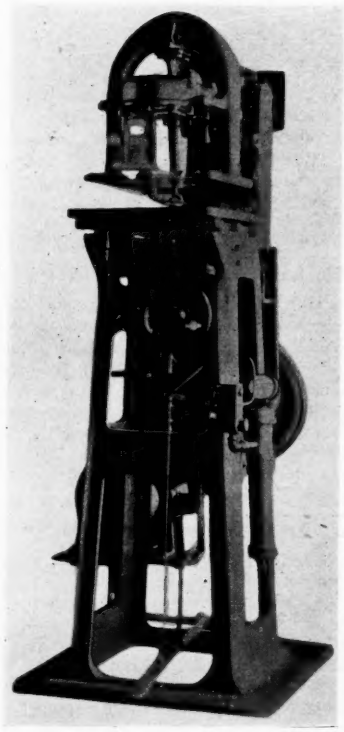
THESE ULTRA-FINE FILLERS ARE MICRO-MINERALS. *Rubber Age (London)*, May, 1939, pp. 87-88.

ON SOME LATEX-TYPE SYNTHETIC EMULSIONS. *Rubber Age (London)*, May, 1939, pp. 89-91.

VULCANIZED LATEX. H. J. Stern, *Rubber Age (London)*, May, 1939, pp. 93, 95, 97.

AFRICAN ROADS AND TIRES. W. W. Foster, *India Rubber J.*, Apr. 22, 1939, pp. 10-13.

New Machines and Appliances



Patten Sole Cutter

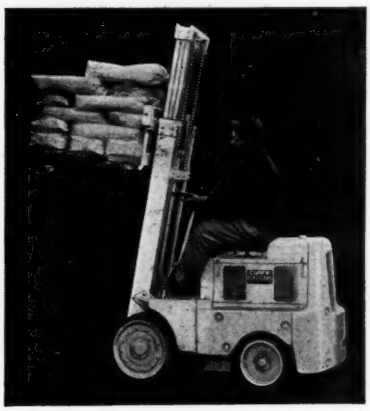
Heavy-Duty Sole Cutting Machine

A HEAVY-DUTY machine, of the Patten air-lift motor-driven type, for cutting soles and heels incorporates improvements in certain construction details that will permit the cutting of heavier stocks than was possible on its lighter predecessor. Soles with a thickness of 1/32- to 5/8-inch and heels 1⅜ inches thick may be cut; while adjustments provide for cutting soles or taps either vertically or on a bevel, the range of angle being 27 to 90°. The machine will cut from 3,500 to 5,000 pairs of soles per day.

The heavy duty requirements of the new cutter were met by utilizing a cutting blade of heavier material and by increasing the cylinder diameter from three to four inches, thus providing a 100% increase in pressure. The use of a taper clutch also improves the performance under conditions of heavy service. The cutter is completely self-contained; power is supplied by a two h.p. motor. This machine is said to be equally suitable for cutting thinner stock for light shoes. Wellman Co., Medford, Mass.

Bag Handling Truck

A FINGER-LIFT truck of new design, known as the Carloader, provides for the convenient handling of bagged or baled materials that have been piled on skids or pallets. The new truck, only 38 inches wide, pivots on one wheel, enabling it to operate in cramped quarters. The driver is mounted comfortably on top where he has clear vision of his pick-up, but is amply protected by the hoist uprights. The forks will pick up loads with as little as two-inches underclearance, and the machine will carry its burden at speeds of from one to seven miles per hour. There are 11 models with capacities up to 3,500 pounds and tiering limits up to 108 inches. In addition to its use in the plant the truck may be employed for loading or unloading freight cars. Clark Tructractor.



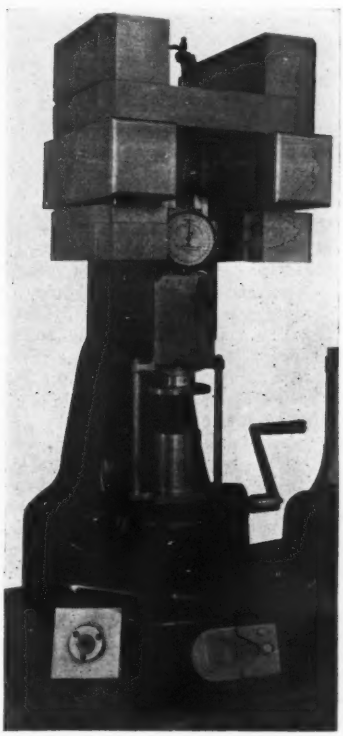
Clark Carloader

Weight-Deflection Compression Tester

DESIGNED particularly for making weight-deflection tests on rubber engine mounts and body pads for automotive construction, the Model 64 compression testing machine consists of a vertically operated anvil and a weighted upper pressure pad between which the rubber specimen is placed for testing. An actuating mechanism, hand or motor driven, raises the anvil and superimposed specimen against the upper pressure pad to which has been applied two different sets of weights, a minor and a major load, thus providing compression pressure in two stages. The deflection of the specimen is measured by a dial indicator, graduated in thousandths of an inch.

Not until the minor load is actually raised does the dial indicator, by means of an electro-magnetic device, start registering. Accordingly the preliminary compressing of the specimen by the minor load, usually only a few thousandths of an inch, serves merely to insure good contact between the anvil and the specimen and between the pressure pad and the specimen, thus reducing inaccuracies resulting from slightly malformed specimens. As the anvil travels farther, the major load is applied; the deflection resulting from this added load is registered on the dial indicator. Thus the deflection of the sample, as measured, constitutes the compression caused by the major load. The range of the dial indicator in terms of vertical travel is one inch.

Upper pressure pads and the anvil may be made to fit any type of specimen. Minor loads that may be applied range from 20 to 200 pounds; while major loads range from 80 to 400 pounds. These load adjustments are said to be suitable for any of the ordinary automotive engine mounts or body pads currently in use. It is presently contemplated building a larger machine in which the loads can be adjustable over a higher range to suit truck, bus, rail car, and other large automotive rubber applications. Gogan Machine Corp.



Gogan Model 64 Compression Tester

New Goods and Specialties

"The Road of Tomorrow" Featuring Monocork Surface at the Ford Exhibition Building, New York World's Fair

New Motor-Cycle Tire

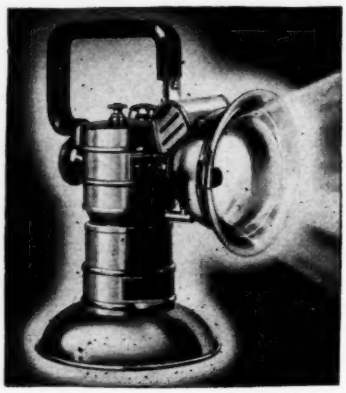
AN INNOVATION for motor-cycle use is the new tire with twice the air volume of usual motor-cycle tires, only 10 pounds' air pressure, and circular ribbed tread to which the "squeegee tread" principle of the Dual 10 and Dual 8 automobile tires has been adapted. Soft and flexible, this tread is said to wrinkle into squeegee action when either brakes or power are applied, gripping and holding the tire to the pavement, for quick, straight stops on wet, slippery surfaces. Other advantages claimed are greater mileage, reduction of danger of sideslip, possibility of making sharper turns with safety, absorption of ruts and bumps, safe crawling over slippery car-tracks, and greater comfort. General Tire & Rubber Co., Akron, O.

Latex Flooring

MONOCORK, new in this country, but successfully used for five years in Europe, is a versatile plastic flooring material composed of latex, a dehydrating powder, and bulking fillers such as cork granules, marble chips, or other types of aggregates. These three component parts are mixed on the job and applied at once as a plastic with an ordinary trowel.

Monocork is said to adhere to any clean surface—wood, steel, concrete, or masonry—to form a monolithic flooring. With excellent bonding properties, it adheres without the aid of mechanical reenforcements; and it can also be used as an adhesive for tile, wood block, parquetry, or other types of flooring. Applied in plastic form, it smooths out irregularities in the subfloor. The plastic material takes an initial set in eight to 12 hours and a final set in from 24 to 48 hours, depending upon temperature and humidity.

Monocork makes a flexible, resilient floor said to be resistant to wear and abrasion, impervious to water, and highly non-slip, either wet or dry. It may be pigmented for color, and the addition of marble chips or decorative aggregates permits a variety of resilient terrazo floors. Standard colors are dark gray, maroon, brown, and battleship gray. Monocork, which is suited for both exterior and interior work, has been installed as a road finish over concrete; on hospital, factory, zoo, and depot ramps; in stores, lobbies, and entrances; and as an adhesive for tiles in the construction of swimming pools. In the marine field it is used as a deck flooring and for streamlining hulls. More recently it has found extensive use at the New York World's Fair for ramps, walls, floors, and roads. Armstrong Cork Co.



Lamp with Rubber Insulation on Handle

Rubber Number Plates

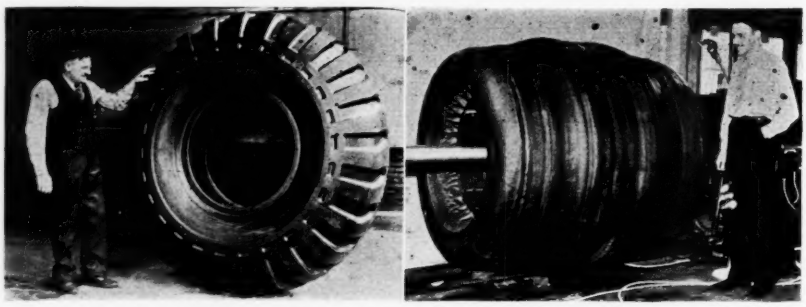
RUBBER number plates are made of a specially hardened rubber stock which allows a certain flexibility. The separate letter and digits are also of rubber and provided with metal pegs. They are held securely to the plates by means of clip-on buttons which fit recesses in the rear of the plate. Goodyear Tire & Rubber Co. (Great Britain).

Insulated Lantern

A NEW lantern, adapted to meet the requirements of car inspectors, signal and maintenance men, contractors, and public utility departments, utilizes molded rubber insulation on the handle which protects the user should the lamp frame contact electrically charged equipment and, furthermore, insures a comfortable hand hold when carried. National Carbide Corp.

White Sidewall Paint

MADE with a rubber base, a new white sidewall tire paint is applicable for renewing white sidewall tires or for making present black sidewalls white. The paint is self-vulcanizing, and, as it flexes with the tire, it will not crack or chip. Application is by brush, and the paint dries quickly. Washing with soap or water will not affect the original whiteness, it is claimed. B. F. Goodrich Co., Akron.



Left, Giant 24.00 by 32 Earth-Mover Tire Which Stands Seven Feet High, Weighs 1,500 Pounds, Has a Load Capacity of 12½ Tons, and Is Made of 34-Ply Construction with Maximum Tread Thickness of over Three Inches. *Right,* Tire on Building Drum before Forming and Curing. United States Rubber Co., 1790 Broadway, New York, N. Y.

Rubber Industry in America

OBITUARY

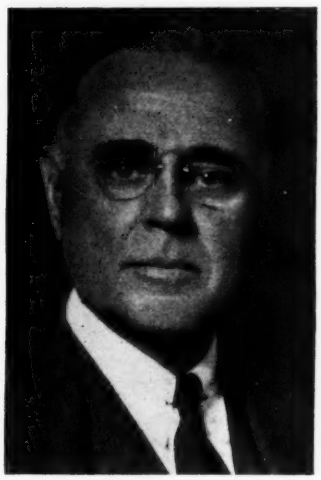
Arthur H. Marks

WHILE playing tennis at his Palm Beach estate on May 1, Arthur Hudson Marks collapsed and died immediately. Mr. Marks is credited with being one of the first men in the rubber industry to realize the value to it of chemical research; he is the inventor of the Marks' alkali process (patented October 17, 1899) for reclaiming vulcanized scrap; he secured several patents relating to machines, processes, and products of the rubber industry; he is credited with the introduction of the cord tire to the United States (1911); and he was an important factor in the adoption of carbon black as a reenforcer in manufacturing tires (1912).

Mr. Marks was born in Lynn, Mass., in 1874. After graduating from Lynn Classical School and attending Harvard University for two years, he decided to be a chemist, not a physician, so in 1895 secured employment with the Boston Woven Hose & Rubber Co., Cambridge, Mass., as assistant chemist. Two years later he resigned to become chief chemist for the Revere Rubber Co., Chelsea, Mass. Then, in 1898, he joined the Diamond Rubber Co., Akron, O., as superintendent and in 1902 was elected vice president and general manager.

After the issuance of the patent for the Marks' alkali reclaiming process, organization of the Alkali Rubber Co., Northwestern Rubber Co., Ltd., (Liverpool, England), Pan American Rubber Co., and International Process Co. followed, with Mr. Marks president of all these companies. When the Alkali company merged with The Philadelphia Rubber Works in 1910 to become The Philadelphia Rubber Works Co., Mr. Marks remained as vice president. From 1912, when the Goodrich and Diamond organizations were merged, he served as vice president and general manager of the consolidated company, until the United States entered the World War. He remained, however, as a director until 1921.

Offering his services in 1917 to the government he was made a lieutenant-commander in the United States Naval Reserves and placed in the bureau of construction and repair. In February, 1918, Lieut.-Commander Marks was transferred to the army and made director of the chemical warfare service. But two months later he was retired because of illness and upon his recovery became vice president of the Curtiss Airplane & Engine Co., in charge of its Garden City plant, until after the armistice. He remained for some time as a director.



Conway Studios, Inc.

Arthur H. Marks

In 1920 Mr. Marks acquired a large interest in Van der Linde Rubber Co., Ltd., Toronto, Ont., Canada, and was made a director and vice president. At the same time he was elected president of the Aeolian-Skinner Organ Co., which post he relinquished only early this spring.

In 1930 he returned to Goodrich as a director and in September, 1937, was named vice chairman of the board, positions he held at the time of his death.

The deceased belonged to the New York Yacht, Racquet and Tennis, Harvard, Seminole, and Palm Beach clubs.

He is survived by his third wife, a son by his first marriage, and a brother.

Funeral services were held in the Church of the Incarnation, New York, on May 4. Among the honorary pallbearers were officials from the Goodrich company. Burial was in Woodlawn Cemetery.

M. R. Stevenson

MYRON ROBERT STEVENSON, affiliated with the Hood Rubber Co., Watertown, Mass., since October 1, 1906, died on April 25. After graduating from Concord, Mass., high school he joined the cost and construction department of the Hood company. In 1925 he was transferred to San Francisco as district sales manager, but returned to Watertown two years later to become manager of footwear.

The deceased, who was born on January 25, 1890, in Rutland, Mass., was a director of the Oakley Country Club, a member of several Masonic lodges, and chairman of the parish committee, First Parish Church, Watertown, where funeral services were held April 27, with burial in Mt. Auburn Cemetery, Cambridge.

Mr. Stevenson leaves his wife, a daughter, a son, a granddaughter, a sister, and a brother.

C. H. Swoger

CHARLES H. SWOGER, for many years a salesman for the Home Rubber Co., Trenton, N. J., until he retired about three years ago, died May 8 after a brief illness. He worked for the Union Rubber & Asbestos Co., Trenton, before joining the Home sales force. A widower, he leaves a daughter. Burial was in Homewood Cemetery, Pittsburgh, Pa., his native city.

A. R. Pette

ALFRED R. PETTE, for the past 58 years foreman of the Hamilton Rubber Mfg. Co., Trenton, N. J., died May 7 after a brief illness. A member of the Masons, Odd Fellows, and Jr. O.U.A.M., he is survived by his wife, a son, two sisters, and a brother. Burial was in Greenwood Cemetery, Trenton.

Peter J. Burke

PETER J. BURKE, until recently with the Mechanical Fabric Co., Providence, R. I., died suddenly from a heart attack on April 12. Mr. Burke, a resident of Cranston for the past 20 years, came to Rhode Island as superintendent of the Atlantic Tubing Co. He is survived by his wife and three daughters.

A. V. W. Tallman

ALBERT V. W. TALLMAN, 64, in the rubber brokerage business for 38 years, with offices at 110 Broad St., New York, N. Y., died at his home in Westerleigh, Staten Island, on April 26. He had also been a director of the West New Brighton (S. I.) Bank for several years. His wife survives. Funeral services were held on April 28 in Port Richmond, S. I.

TAXES PAID ON TIRES DURING APRIL totaled $3,507,049, against $1,821,801 in April, 1938; and on inner tubes, $645,059, against $364,179.

FINANCIAL

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

Aetna Rubber Co., Cleveland, O. For 1938: net loss, $46,826, against net loss of $22,888 in 1937.

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., and subsidiaries. March quarter: net profit, $1,040,478 after depreciation, depletion, research and process development expenses, interest, amortization, federal income taxes, minority interest, etc., equivalent after preferred dividend requirements to 39¢ a share on 2,618,369 shares of combined class A and class B common stocks outstanding at the close of the period, excluding shares held by subsidiaries. This compares with $94,077 or 3¢ a share on combined 2,520,368 shares of A and B common stocks in the March quarter of 1938.

American Zinc, Lead & Smelting Co., Columbus, O., and wholly owned subsidiaries. March quarter: net profit, $44,769, equal to 67¢ each on 66,553 shares of $5 convertible prior preferred stock. Net profit, $13,053, or 20¢ each on 66,553 shares of $5 perferred stock last year. Net sales, $1,855,577, against $1,883,296.

Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y. March quarter: net loss, $77,161, after interest, depreciation, federal income taxes, and other charges, against net loss of $309,790 in the March quarter last year.

British United Shoe Machinery Co., Ltd., Leicester, England. For 1938: net income, £529,571, against net income of £581,964 in 1937.

Brown Rubber Co., Inc., Lafayette, Ind. March quarter: net income, $4,943, equal to 2¢ each on 200,000 shares, against net loss last year of $11,827.

Dayton Rubber Mfg. Co., Dayton, O., and subsidiaries. November 1, 1938, to February 25, 1939: net income, $167,422 equal to 77¢ each on 176,670 common shares after dividend requirements on Class A preference stock.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and wholly owned subsidiaries. March quarter, 1939: net profit, $19,075,376. After provision for senior dividends and minority interest $17,109,459 remained, or $1.55 a share on 11,055,921 shares for the common stock. The figure includes dividends received from General Motors Corp., which were equivalent to 68¢ a share for the du Pont common stock. In the corresponding period of 1938 net profit was $9,060,602; the amount available for common stock, $7,176,571, equal to 65¢ a share on 11,037,947 shares including 22¢ derived from the investment in General Motors. Profit and loss surplus on March 31, 1939, was $266,230,106, against $256,251,529 on December 31 and $252,106,577 on March 31, 1938. Net sales for the quarter were $66,641,738, against $52,094,385 for the March quarter of 1938, and income from operations after costs and operating charges, expenses and provision for depreciation and obsolescence was $13,804,717, against $7,111,664. Total income was $21,783,564, including $7,500,000 received from General Motors, against $10,063,790 and $2,447,383 respectively in the first quarter of 1938.

Everlastik, Inc., Chelsea, Mass. For 1938: net loss, $105,650, against $31,240 loss in 1937.

General Electric Co., Schenectady, N. Y. First quarter, 1939: profit available for dividends, $7,373,431, or 26¢ a share, against $7,075,739, or 25¢ a share, in the March quarter last year; sales billed, $68,537,269, against $65,086,557; orders received, $86,882,953, against $65,376,400 for the corresponding period in 1938.

Hercules Powder Co., Wilmington, Del. First quarter, 1939: net earnings, $1,087,322, after deductions for federal taxes and depreciation, equal to 73¢ a share on an average of 1,316,710 outstanding shares of common stock, after dividend payments on the preferred. This compares with $656,027, or 40¢ a common share in the first quarter last year. Current assets on March 31 totaled $21,692,486, including cash and marketable securities, $10,153,078.

Okonite Co., Passaic, N. J. For 1938: net loss, $205,483, against net income of $538,527, equal, after preferred dividends, to $39.96 each on 12,000 common shares in 1937.

Raybestos-Manhattan, Inc., Passaic, N. J. March quarter, net income $316,401.59, or 50¢ per share, after providing $174,361.16 for depreciation, and $77,169.57 for federal and state income taxes. Assets at March 31, 1939, totaled $17,846,014.31, including $9,109,023.19 of current assets, equivalent to nine and one-half times the current liabilities. There were no banking or funded debt or other capital obligations outstanding.

Skelly Oil Co., Chicago, Ill., and subsidiaries. March quarter: net income, $239,080, equal after preferred dividend requirements, to 14¢ each on 995,348 common shares, against $664,771, or 56¢ each on 1,003,949 common shares. Twelve months to March 31: net income, $2,224,364, or $1.85 a common share, against $5,618,703, or $5.20 a common share for the twelve months to March 31, 1938.

United Carbon Co., Charleston, W. Va., and subsidiaries. March quarter: net profit, $459,202, after charging off expenses, taxes, depreciation, depletion, and federal and state taxes, equal to $1.15 each on 397,885 shares of no-par common stock and contrasted with $438,364, or $1.10 a share, for the first quarter of 1938. Current assets on March 31, 1939, totaled $4,031,811, including $1,701,467 cash, and current liabilities were $966,690. A year earlier current assets were $3,679,115, with cash of $1,451,784, and current liabilities were $1,074,780. Inventories amounted to $968,923, against $971,872.

United Shoe Machinery Corp., Boston, Mass. Year ended February 28: net income after taxes, $9,477,129.46, equivalent, after deduction of preferred dividends paid ($414,688.65), to $3.95 per share of common stock based upon the average number of shares outstanding during the year.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Armstrong Cork Co.	Com.	$0.25 interim	June 1	May 8
Armstrong Cork Co.	Pfd.	$1.00 q.	June 15	June 1
Canadian Wire & Cable Co.	A	$1.00 q.	June 15	May 31
Canadian Wire & Cable Co.	Pfd.	$1.62½ q.	June 15	May 31
Dayton Rubber Mfg. Co.	Com.	$0.50	May 20	May 10
Dewey & Almy Chemical Co.	Com.	$0.25 irreg.	June 15	June 1
Dewey & Almy Chemical Co.	Pfd.	$1.25 q.	June 15	June 1
E. I. du Pont de Nemours & Co., Inc.	Com.	$1.25 interim	June 14	May 22
E. I. du Pont de Nemours & Co., Inc.	Pfd.	$1.12½ q.	July 25	July 10
E. I. du Pont de Nemours & Co., Inc.	Deb.	$1.50 q.	July 25	July 10
Faultless Rubber Co.	Com.	$0.25 q.	July 1	June 15
General Electric Co.	Com.	$0.25	July 25	June 23
Johns-Manville Corp.	Cum. 7%	Pfd. $1.75	July 1	June 16
I. B. Kleinert Rubber Co.	Com.	$0.10	June 30	June 15
Raybestos-Manhattan, Inc.	Com.	$0.25	June 15	May 31
Rome Cable Corp.	Com.	$0.10 initial	July 1	June 10
Thermoid Co.	$3 Pfd.	$0.60 accum.	June 15	June 5
Thermoid Co.	Pfd.	$0.60 irreg.	June 15	June 5
United Elastic Co.	Com.	$0.10	June 24	June 2
Westinghouse Electric & Mfg. Co.	Com.	$0.50 irreg.	May 29	May 9
Westinghouse Electric & Mfg. Co.	Pfd.	$0.87½ q.	May 29	May 9

EASTERN AND SOUTHERN

BUSINESS seems to be marking time, with its eyes on Washington and Europe. In fact industrial activity has decreased gradually since the first of the year, although conditions have been much better than a year ago. One authority reports that from the near-term point of view business fundamentals are quite favorable. Production schedules have been adjusted to meet demand; while inventories have declined to more satisfactory levels. As a result of greater efficiency, business management in many fields reported good earnings despite high operating costs and heavy taxes. Many local communities, becoming strongly tax conscious, are placing their finances on a sounder basis; and banks throughout the nation are in the strongest position in many years, with ample funds available for all deserving enterprises. Reports of increasing employment are coming in, as well as gains in construction activity.

Presenting the darker side of the picture were the war threat, the inclement weather, the coal strike, and the decline in automobile output and steel production. Steel production last month continued to drop, going to 45.4% of capacity, with a pick-up expected, however, as soon as motor car and truck manufacturers place steel business for initial runs on 1940 models; this business should develop soon. Footwear production has receded, mostly because of a decline in orders, both wholesale and retail. A drop in orders also is reported for machine tools.

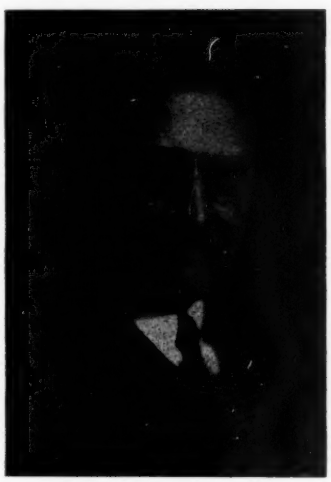
Cabot Presents "Inside the Flame"

On May 18 guests of Godfrey L. Cabot, Inc., Boston, Mass., attending the preview of "Inside the Flame," a sound movie on the story of carbon black, were greatly impressed by the clear exposition of this highly technical subject. The preview was held in the studio of Caravel Films, Inc., 730 Fifth Ave., New York, N. Y., which produced the 40-minute film for the Cabot company. Translating the story of carbon black into motion pictures took over a year of painstaking study and experimentation. Tremendous difficulties were involved in the camera work, particularly when taking shots of the flames in the hot-house. The effort was worthwhile and has resulted in an outstanding contribution to this subject.

The movie stresses scientific fundamentals, explaining how the tiny particles are formed within the flame and emphasizing the importance of close technical control in every step of the process. The picture compares carbon in three of its important forms: diamond, graphite, and carbon black, by showing crystal models which illustrate the relative spacing and arrangement of the carbon atoms that determine the physical characteristics of the product. This is confirmed by comparative X-ray diffraction patterns of the three substances. Flame characteristics as they affect the type of product formed are portrayed. Photomicrographs show different types of black dispersed in rubber and demonstrate that properly vibrating carbon black particles will form aggregates, the basis of the Spheron process.

The New Jersey Zinc Sales Co., 160 Front St., New York, N. Y., in June promotes Myron T. Bennett from the Chicago territory to New York as assistant manager of the Pigment Division, to work directly under H. M. Neumann, manager of the division, with whom Mr. Bennett has been closely associated since he joined the company shortly after graduating from Knox College in 1923. John Matthias will be in charge of all pigment sales in the Chicago territory.

Baldwin-Southwark Corp., Philadelphia, Pa., recently appointed F. G. Schranz general manager. After technical training as a graduate mechanical and electrical engineer in Vienna, he joined the Midvale Corp., Philadelphia, as a machinist in 1904 and the next year became a designing engineer for R. D. Wood & Co. at its Camden Iron Works. Then in 1915 he went to the Southwark Foundry & Machine Co., Philadelphia, where he aided in starting the manufacture of hydraulic machinery and special equipment. Mr. Schranz served as vice president in charge of sales and engineering and a director of the Southwark company and then as sales manager and manager for the Southwark Division after Southwark was acquired by The Baldwin Locomotive Works in 1929. A year later I. P. Morris & De La Vergne, Inc., and the De La Vergne Engine Co. were included with Southwark in the incorporation of the Baldwin-Southwark Corp.



F. G. Schranz

Acorn Insulated Wire Co., 225 King St., Brooklyn, N. Y., which W. R. Prosser, as a private individual, operated until his death on December 28, 1938, on April 13 was incorporated as Acorn Insulated Wire Co., Inc., with the following officers, who also constitute the board of directors: M. C. Prosser, president; Harry M. Moorhead, secretary; and Edward S. George, treasurer and general manager.

Murray Rubber Co. recently moved from 1820-24 Washington Ave. to larger quarters at 606-608 N. Milby St., Houston, Tex. The new brick building, 65 by 130 feet, with boiler room 20 by 24 feet, covers about one-third of the ground that Murray owns, with a view to possible expansion. The company, of which Lynne Murray is manager, has 23 employes and manufactures mechanical rubber goods, tire repair material, cushion-tread, cord, and camelback.

Ajax Flexible Coupling Co., Westfield, N. Y., according to Vice President Wayne Belden, has appointed the Chicago Pulley & Shafting Co., 17-23 N. Desplaines St., Chicago, Ill., distributer of Ajax flexible couplings.

U. S. Rubber Co.

United States Rubber Co., 1790 Broadway, New York, N. Y., has announced through F. B. Davis, Jr., chairman and president, that it has arranged with all the holders of its First Mortgage and Collateral Trust 4¼% Bonds, Series 'A,' due July 1, 1958, for a reduction in the interest rate to 3⅝% per annum, effective July 1, 1939. A supplement to the indenture has been prepared which provides for the change in interest rate and certain other changes of a corollary nature. After the July 1, 1939, sinking fund payment of $1,000,000, the total bonds outstanding at that date will be $43,000,000 First Mortgage and Collateral Trust 3⅝%, Series 'A.' This issue, originally $45,000,000, was sold privately July 1, 1938, to three insurance companies and to the United States Rubber Co. Insurance Fund. The new interest rate will effect a saving to the company for the last half of 1939 of $134,375.

Mr. Davis also announced that W. H. Cobb, formerly general factory manager, mechanical goods division, has been named general manager of the mechanical goods and general products divisions, including supervision of the manufacture of Lastex yarn and rubber thread. Vice President Herbert E.

Smith will continue supervision of all activities of the divisions. A graduate of Stevens Institute of Technology, Mr. Cobb joined U. S. Rubber in 1914.

"U. S. Royal" Tires to be Produced in Sweden

On May 23 President Davis announced that a cooperative agreement had been made whereby "U.S. Royal" tires for the Swedish market will be manufactured by the Svenska Gummifabriks A/B, in Gislaved, Sweden, which company is owned by the Swedish firm, Kooperative Forbundet. The agreement involves an exchange of engineers and other experts between the United States and Sweden, and a great part of the tire-building materials, including chemicals, cord, and crude rubber, to be used in the fabrication of Swedish produced "U.S. Royal" and "Gislaved" tires will be supplied from U. S. Rubber Co.'s domestic plants and Far Eastern plantations. Confirmation of the conclusion of the agreement was made by Albin Johannson, president of Svenska Gummifabriks A/B who together with his technical advisor, C. G. Gislow, had conducted the discussions with Mr. Davis and John B. Tower, of New York, director of sales of the United States Rubber Export Co., Ltd.

"Vamos Lastex"

An agreement has been arranged between manufacturers licensed by U. S. Rubber to make Lastex shoe materials and the firm of Alfred Vamos, 47 W. 34th St., New York, N. Y., whereby the latter becomes sole distributer of these materials. As part of the plan to guard footwear manufacturers and dealers against unauthorized and unsatisfactory elastic fabrics, all approved goods will be imprinted with the words "Vamos Lastex."

Carl L. Reed, export manager, Kelly-Springfield Tire Co., Cumberland, Md., recently returned home after several weeks in England, Sweden, Switzerland, and Holland, where, he said, there is not nearly so much talk about war as in America. The people of these countries seem to be going about their business calmly, with comparatively little agitation over the possibility of war.

L. A. Dreyfus Co., Rosebank, Staten Island, founded in April, 1909, now employs 102 workers, 11 of whom were in the first plant. The company has specialized in the manufacture of gutta percha compounds since its inception, selling only in bulk to other manufacturers and making no finished articles. Compounds developed have been for sealing the seams of tin cans, insulation for electric wires, etc. Executives include Ellsworth B. Buck, chairman of the board; Walter A. Tyler, president and treasurer; Richard P. Dyckman, secretary; E. M. Walsh, assistant treasurer; Joseph Mazzeo, general foreman.

Whiting Freight Rates

In a decision on March 7, 1939, on Docket No. 27921, Southwark Mfg. Co. vs. Pennsylvania - Reading Seashore Lines, et al., the Interstate Commerce Commission ordered maximum reasonable rates on both ground limestone and chalk whiting at 20% of the corresponding first-class rates. The I.C.C. also held that the respondents should maintain within the State of New Jersey rates not less than the corresponding interstate rates. The findings contemplate that the same level of rates will be maintained on chalk whiting and on limestone whiting. The rates recommended will result in reduction on chalk whiting and increases on limestone whiting. Limestone whiting or whiting substitute which is affected by this decision has been defined as limestone ground or pulverized to fineness such that 98% will pass through a screen of 200 meshes to the inch. This product, the I.C.C. contends, has similar transportation characteristics to chalk whiting and is in direct competition with the latter commodity in most of its uses, and, therefore, the two commodities should be upon a rate parity.

U. S. Rubber Ordered by FTC to Correct Tire Sales Practice

On April 28, 1939, the Federal Trade Commission ordered United States Rubber Co. and one of its subsidiaries, U. S. Tire Dealers Corp., both of New York, to discontinue price discriminations and payment of special commissions in violation of the Robinson-Patman Act in the sale of automobile tires and tubes.

Price discriminations or special commissions were found to have been made or paid in the sale of U. S. Rubber products in favor of certain mail-order and chain-store organizations, oil companies, and other large dealers and certain users and consumers through the respondents' own retail outlets.

In their answer to the Commission's complaint the respondents stated that they had discontinued operation of their retail stores.

On April 28, F. B. Davis, Jr., chairman and president, United States Rubber Co. made the following statement:

"We have received a copy of the Order of the Federal Trade Commission in the proceeding brought against United States Rubber Co. and U. S. Tire Dealers Corp. When the complaint was issued in January we said that it has always been our aim to operate our business in strict accordance with the law. This is not always easy until the exact rules are laid down, because business in a country as big as the United States is a complicated matter. Now that the Federal Trade Commission has issued its order in this proceeding we expect as promptly as possible to make such changes in the operations of the Dealers Corporation and in its relations with customers as will accomplish the intention of the Federal Trade Commission and comply with the law as interpreted by the Commission. This can be done without disturbing our relations with any of our customers."

This latter statement is taken as an indication that U. S. is to continue the manufacture of tires and tubes for the mail order, petroleum, and chain organizations mentioned in the FTC complaint.

To conform with the requirements set forth in the FTC order U. S. Tire Dealers Corp. revised its contracts with dealers effective May 1. The new contract provides for the payment of bonuses ranging from 1% for annual purchases of $15,000 up to 2½% for purchases of $50,000 or over which compares with former bonuses ranging from 1% for purchases of $5,000 up to 7½% for purchases of $50,000 or over. A second revision in the U. S. contract provides that only purchases of U. S. brand tires and tubes shall be calculated in determining the dealers' share of any residue distributed by the U. S. Tire Dealers Corp. Formerly dealer participation was determined by purchases of all makes of U. S. and subsidiary companies' tires and tubes, batteries, repair materials, etc.

The United States Labor Department, Washington, D. C., recently announced the awarding of numerous supply contracts by federal agencies including: Navy, electric cable, Phelps Dodge Copper Products Corp., 40 Wall St., New York, N. Y., $70,539; General Electric Co., Schenectady, N. Y., $54,-164; Anaconda Wire & Cable Co., 25 Broadway, New York, $55,263; Rockbestos Products Corp., New Haven, Conn., $70,412; Okonite Co., Passaic, N. J., $150,619; Collyer Insulated Wire Co., Pawtucket, R. I., $75,970; Treasury, procurement, tires and tubes, amount indefinite, United States Rubber Co., 1790 Broadway, New York, Armstrong Rubber Co., Inc., West Haven, Conn., and Richmond's Tire Shop, Trenton, N. J., and tires, Overman Tire Co., Inc., Belleville, N. J.; WPA, wire and cable, Westinghouse Electric Supply Co., 150 Varick St., New York, $11,245, and cable, General Electric Supply Corp., 585 Hudson St., New York, $17,273; War, cable, John A. Roebling's Sons Co., 107 Liberty St., New York, $10,-549; Navy, hose, Goodall Rubber Co., Trenton, N. J., $23,999.

E. R. Bridgwater, manager, Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., in an address on May 3 before the Chamber of Commerce of the United States in Washington, D. C., asserted chemical rubber could replace natural rubber if America's supply from the Far East were restricted, and this substitution could be effected without sacrificing the quality of finished products.

(*Continued on page 78*)

OHIO

THE rubber industry has started its seasonal slowing down in production, with attendant drops in employment, earlier than usual this year, partly because of the reduced automobile assembly schedules.

One authority reports that operating statistics of the rubber manufacturing industry recorded notable gains for the first three months of 1939, against the corresponding period last year; crude rubber consumption rose 66%; sales of original equipment tires increased 124%, the degree of improvement having been intensified by the fact that automobile manufacturers were letting their inventories run down a year ago; replacement tire shipments gained 42%. Tire production during the first quarter of 1939 was about 12% greater than total shipments, but manufacturers' stocks at the end of March were still below those of a year previous.

General Tire & Rubber Co., Akron, through H. A. Bellows, eastern division manager, has announced promotion of L. E. Marlowe and J. C. Powers from sales representatives in the New York area to assistant district managers in the New York sales district. Mr. Marlowe has been in the tire sales field since 1922, two years after his graduation from Mt. Union College, with various companies until joining General Tire in 1934. Married, with two children, he makes his headquarters in Baltimore, Md., where his home is. Mr. Powers was graduated from Harvard College in 1925, has been in the tire sales work with several companies constantly since then, and joined General Tire in 1934 as a special sales representative.

Promotion of two other sales representatives was also announced by Mr. Bellows. H. T. Rattigan heads sales of accessory and special products in the eastern division. A member of the General Tire sales force for the past seven years, following several years of previous experience with other companies in the rubber accessory field, he resides in Philadelphia. J. J. Muckenhoupt was named division truck tire manager for the eastern division. For the past year he represented the company in Connecticut, previously having spent several years as district truck tire representative for another rubber company in the Newark district. His headquarters will be at the eastern offices of General Tire, 1776 Broadway, New York, N. Y.

The DeVilbiss Co., Toledo, O., has moved its New York, N, Y., sales and service branch, industrial division, to 111 Eighth Ave. in the Port Authority Commerce Building, where improved transportation, trucking, and parking facilities are available.

Association of Crude Rubber Users

At the suggestion of a prominent manufacturer of rubber products an attempt is being made to organize an association of crude rubber consumers to consist of all people interested in seeing crude rubber grown in the western hemisphere in order to provide an independent and assured source of supply for the rubber users of this country. Inviting those interested to attend a meeting to be held on June 12 at the Cleveland Hotel, Cleveland, O., letters have been sent to more than 500 consumers of crude rubber by Stewart N. Clarkson Associates, Inc., 420 Lexington Ave., New York, N. Y.

The objectives of the association are:

1. To promote and protect the interests of individuals, firms, and corporations depending upon a supply of crude rubber as a raw material in all or part of their business.

2. To promote measures to insure an adequate and uninterrupted supply of crude rubber to the North American market for our economic welfare and national defense.

3. To foster the scientific development and growth of crude rubber in the western hemisphere.

4. To promote the expansion of reciprocal trade relations within the western hemisphere.

5. To collect and disseminate information on crude rubber of value to members and the public.

6. To cooperate with governmental and other agencies, in accomplishing the objects of the association.

It is understood that no investment of private capital is contemplated, but that early efforts will be centered on stimulating and coordinating research and development on the part of the several governments concerned. The meeting on June 12 is called for the purpose of appraising the general interest in this proposal and crystallizing the ideas of the industry in this direction. The activities of the group are not intended to duplicate or conflict with those of any other rubber association.

Goodrich Activities

At the recent stockholders' meeting of The B. F. Goodrich Co., Akron, David M. Goodrich, chairman, stated that the business showing for the company for the first quarter of 1939 was greatly improved over that of the corresponding period last year. He estimated the company's net profit for the 1939 quarter at $650,000, against a loss of $1,600,000 in the 1938 period.

New Mechanical Goods Factory

Goodrich will erect a $1,500,000 mechanical rubber goods factory at Clarksville, Tenn., to begin production in the autumn, according to an announcement on May 1, by S. B. Robertson, president, and T. G. Graham, vice president, to the Clarksville Chamber of Commerce.

On a 30-acre tract the new plant, a modernistic building of brick, concrete, steel, and glass, will be 800 feet long, 200 feet wide, and contain 200,000 square feet of floor space, with provision for possible future expansion. Products to be manufactured include hose, belting, batteries, soles, heels, gaskets, packing, molded goods, and a variety of mechanical rubber appliances. A power plant for process steam, and a garage, will also be built.

Several hundred people will be employed in the new plant, construction of which will begin immediately, it was announced.

Koroseal Rights Awarded

Widespread household applications of Koroseal, the synthetic rubber-like material introduced by Goodrich, are expected to make an early appearance on the retail market as a result of contracts made with prominent manufacturers in many fields, including Joseph A. Kaplan, New York, N. Y., for shower curtains; Sunlite Corp., Milwaukee, Wis., for table covers; Richards, Boggs & King, Chicago, Ill., raincoats, capes, and umbrellas; Kennedy Car Liner & Bag Co., Shelbyville, Ind., raincoats, sanitary pillow and mattress protectors, and fan, typewriter, and electrical and mechanical equipment covers; J. F. Wall, Cleveland, O., aprons; McCreery Mfg. Co., Cambridge, O., for miscellaneous items and novelties; Royalty Texture Co., Pittsburgh, Pa., for bags and food covers. At least a dozen other contracts are being negotiated.

Koroseal was first introduced to the retail market last year in the form of white raincoats styled by Richards, Boggs & King. The basic fabric used for the coats, as well as for many other items, is a sheer silk coated with the Koroseal.

Among articles said to be under consideration by manufacturers at present are straw, linen, and fabric hats which, when treated with the new substance, are said to remain fresh and unstained by dirt or water.

More than 1,000 household appliances, garments, and utility items, treated with the substance have already been produced by Helen Wright, Goodrich stylist; while industrial scientists have produced a like number of industrial applications of the material.

New Products

Goodrich has added horns and lights to its list of products merchandised nationally. The horns, made especially for the company under the name "Clearway," come in four types, including the Multitone, which has five distinct notes, controlled by a special button on the steering post.

Win Service Pins

In April 40 more employes completed two decades with Goodrich. Included among those who will receive their 20-year pins from President Robertson at the semi-annual ceremonial of the Twenty-Year Service Club this month is Dr. Harlan L. Trumbull, manager of chemical research.

George Hamm, who joined Goodrich in 1909 and devoted most of his time to field sales work, now is manager of Goodrich mechanical goods sales for the Kansas City territory. J. H. Conners, vice president and general manager of the Goodrich mechanical division, last month presented Mr. Hamm with a special employe's service pin.

The Goodyear Tire & Rubber Co., Akron, recently christened its newest company blimp *Rainbow.*

Paul W. Litchfield and L. B. Tomkinson, Goodyear president and general superintendent, respectively, sailed early in May to attend a meeting in London of the International Rubber Regulation Committee. Accompanied by their wives, the two officials, who will return home this month, visited the Goodyear factory at Wolverhampton and also attended the opening of a new plant in Norrkoping, Sweden, where production started in February. The first tire made there was received in Akron last month.

Walter Lee recently returned to Akron after two years as assistant superintendent at Goodyear's Java plant.

Dayton Rubber Mfg. Co., Dayton, through Chairman J. A. MacMillan stated sales for the six months ended April 25, 1939, were 26% greater than those of the same period a year ago.

The Mansfield Tire & Rubber Co., Mansfield, according to J. S. Wainright, general sales manager, has appointed Edward J. Hegarty as merchandise manager. Recently he was on the promotion staff of the New York World's Fair, 1939, and was formerly advertising and sales promotion manager of Standard Air Conditioning, Inc., and merchandise sales manager of the northeastern district of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

The Tenth Anniversary All-Ohio Safety Congress, held in Columbus, April 18 to 20, included an excellent session of the Rubber Section, National Safety Council, Inc., 20 No. Wacker Dr., Chicago, Ill., with Chairman R. W. Morse, of the Firestone Tire & Rubber Co., Akron, presiding. Speakers included E. W. Beck, safety supervisor, United States Rubber Co., 1790 Broadway, New York, N. Y.; M. O'Neil, Firestone dealers' relations manager; and Walter Schneider, The B. F. Goodrich Co., Akron. At the election of officers Vice Chairman U. L. Moler, Inland Mfg. Co., Dayton, was named chairman for the coming year.

MIDWEST

BUSINESS in the Midwest, in general, reflects the sentiments of the rest of the nation. The rubber industry showed a slight improvement; thus 35 firms reported 18,366 employes earning $492,000, gains of 1.3 and 1.6% respectively from the previous month.

Automobile production, however, continued to decline more than seasonally, with manufacturers reducing workweeks and output to fit consumer buying; but in the middle of May output rose contra-seasonally. Used car sales also have not developed as anticipated. A belated rise in consumer interest was observed toward the end of May.

Tires Aid in Safety Award

The National Safety Council, Chicago, Ill., recently awarded in New York, N. Y., to Braniff Airways, Inc., a certificate of special commendation for having operated its passenger transport planes for 47,956,588 miles, from 1932 to 1938, inclusive, without a passenger fatality. Following the award of this certificate, Charles E. Beard, vice president of Braniff Airways, wrote as follows to Ray W. Brown, aeronautical tire sales manager of the General Tire & Rubber Co., Akron, O., whose tires are used on the "Great Lakes to the Gulf" route:

"Aircraft and aircraft maintenance played a most important part in the winning of this award, and in this respect, we feel that your company was a conscious contributor. I use the word 'conscious' intentionally because it has been our experience that, while you may not have had a safety award in mind, you did, nevertheless, apply the same skill and care to your products as though this thought had been foremost in your mind."

[Tires for automobiles or airplanes are of great importance in furthering the cause of safety, and it is of interest to know that recognition is being given to the quality which is being built into rubber products intended for normal consumption.]

National Association of Credit Men, One Park Ave., New York, N. Y., will hold its forty-fourth annual Credit Congress in Grand Rapids, Mich., June 11 to 15.

Monsanto Chemical Co., St. Louis, Mo., has acquired Resinox Corp., Whitehall Bldg, New York, N. Y., third largest manufacturer of phenolic plastics molding compounds. Resinox, which has its manufacturing plant and research laboratories at Edgewater, N. J., was owned jointly by Commercial Solvents Corp. and the Corn Products Refining Co. Financial details of the transaction were not revealed. All Resinox personnel is being retained.

Ford Motor Co., Dearborn, Mich., has announced that Ford tires, formerly available only as original factory equipment on Ford cars, now may be purchased at retail for replacement use, from Ford, Mercury, Lincoln-Zephyr, and Lincoln dealers. Available are four and six-ply black sidewall tires and four-ply white sidewall tires, all in 6.00x16 size. Prices are in line with the other standard makes, and the tires carry the usual warranty.

NEW JERSEY

MANUFACTURERS throughout the State failed to note any improvement in business during the past few weeks and are at a loss to understand why conditions do not improve at this time of the year. The soft coal strike interfered greatly with some manufacturers, and no few plants were compelled to curtail production. One plant reduced working days from five to three a week; while others had to purchase anthracite coal to hold them over.

Mercer Rubber Co., Hamilton Square, finds business has somewhat improved.

Hamilton Rubber Mfg. Co., Trenton has let a contract for a one-story brick office building to cost $4,000.

Charles E. Stokes, president of the Home Rubber Co., Trenton, and Mrs. Stokes have been spending some time at Skytop in the Pocono Mountains. Mr. Stokes was elected a lay member of the Trustee Foundation of the Episcopal Diocese of New Jersey at the annual diocesan convention.

Luzerne Rubber Co., Trenton, has experienced a further slump in the demand for hard rubber specialties.

Martindell Molding Co., Inc., in Ewing Township, near Trenton, having completed its new plant, now awaits the installation of new machinery. Milton H. Martindell, president, expects the factory to be in operation by June 15.

Nearpara Rubber Co., Trenton, reports that business has dropped off considerably.

L. Albert & Son, supplier of rubber mill machinery, is operating with two shifts at Trenton, Los Angeles, Calif., and Akron, O., plants. J. H. Albert has gone to Los Angeles for several months to take charge of the company's western factory and new machine shop.

Resistoflex Corp. has announced that owing to the growing demand for "Resistoflex" PVA material it has had to move to new and much larger quarters, at Belleville, N. J., where the sales and general offices are now combined with the production and engineering departments.

Pierce-Roberts Rubber Co., Trenton, now operates with one shift after a decline in orders.

NEW ENGLAND

FURTHER curtailment in industrial production in New England has been going on, partly because of the fuel shortage, but mostly because of declining orders.

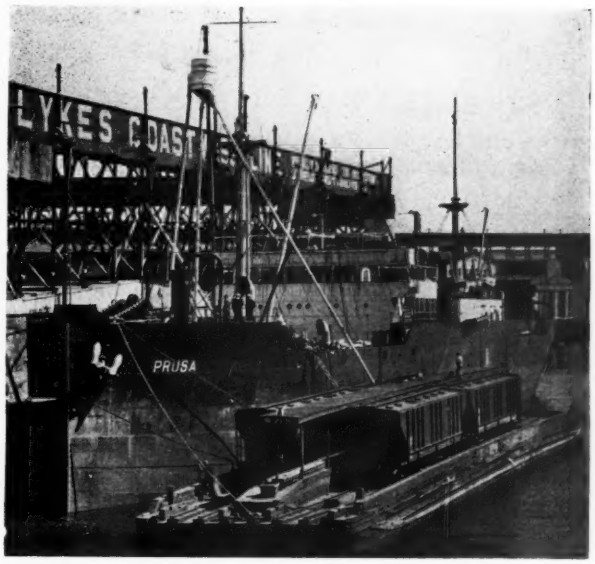
Although payrolls of the manufacturing rubber industry of Rhode Island for April, 1939, total $312,838, were 3% under March, they were 19.6% more than in April, 1938, reported the Brown Bureau of Business Research.

Marine Bulk Shipment of Carbon Black Is Success

On May 12 representatives from a number of rubber companies, carbon black producers, and deep-water steamship companies witnessed the arrival from Corpus Christi, Tex., and the unloading in Boston, Mass., of the first bulk shipment of carbon black ever made in the hold of a ship. To the technicians and engineers of Godfrey L. Cabot, Inc., Boston, Mass., is due the credit for pioneering a unique method of loading, transporting, and unloading carbon black in cargo vessels without loss of material or contamination. When the hatch cover was lifted and at various stages during the unloading, amazement was expressed by witnesses that no carbon black dust or stain was visible and because of the method of handling it was evident that no foreign matter could get into the carbon black. This accomplishment is of outstanding interest to the rubber industry in general and to the carbon black export business in particular.

Three direct objectives of this experimental shipment were: to accomplish efficient, dustless transfer of the bulk black from tank car to the hold of the ship; to determine the possibility of stowing bulk black without leakage, shifting in the hold during transit, or contamination of other cargo by the black or of the black by other cargo; and to accomplish efficient, dustless transfer of the black from the ship's hold to tank cars.

After more than two years of investigation, design, and redesign, the Cabot company developed and constructed small-scale, portable equipment for the transfer of the carbon black to and from the cargo hold. This equipment operates on the principle of a vacuum cleaner and makes use of a specially constructed suction nozzle, a centrifugal separator, and a standard dust removing machine. In loading at Corpus Christi the black ran from the "tank" cars into a large hopper, whence it was drawn up to the separator by a rapid, but gentle stream of air. In the separator the air was removed from the black; after which it was returned to the dust remover, cleaned, and discharged. The black flowed by gravity from the separator into the hold of the ship.



General View of Discharging Operations at Boston

A wooden bulkhead was erected in the hold of the vessel in order that the cargo of black would be inspected both from outside and from the top, during transit and on arrival. It was covered with building paper so that the slightest leakage of the black, or any tendency to chafe, could be detected after unloading. A large dust-tight canvas hold-liner, bag-shaped and treated with pyroxylin, filled this bulkhead, and into it the carbon black was poured through a small, funnel-shaped opening. The full load of carbon black was topped off in a conical heap, and the opening in the bag was sealed tightly. The portable apparatus was loaded aboard and brought to Boston, to be used in unloading the black.

After the 2,000-mile voyage it was found that the cone-shaped top of the load of black had not shifted in any appreciable degree during the normal motion of the ship.

The unloading process was the exact reverse of the loading procedure, except that the "tank" cars were moored on a barge alongside the steamer, thus eliminating the need of adjustments for tide. The portable dust remover and air exhauster were reerected over the cargo hatch; the centrifugal separator was slung above the hold at the end of the jumbo boom; and the delivery pipe led over the vessel's side to the "tank" cars. As the amount of black in the ship's hold diminished, the sides of the canvas hold-liner were drawn up so that the black flowed toward the center, where the suction nozzle was suspended.

Suction Nozzle about to Enter Canvas Hold-Liner at Start of Discharging

Panther-Panco Rubber Co., Inc., recently held an annual meeting featured by the election of officers and the extremely satisfactory financial statement which disclosed a favorable sales increase in all departments. Miah Marcus, formerly treasurer and one of the original founders of the company more than thirty years ago, becomes president, succeeding the late Frank Berenstein. Murray J. Bernstein succeeds Mr. Marcus as treasurer, and will also

(*Continued on page 78*)

Rubber Industry in Far East

MALAYA

Consumption Forecast

That consumption of rubber would reach, if not exceed, 1,000,000 tons in 1939 was the optimistic forecast F. D. Thompson, chairman of the Singapore Chamber of Commerce Rubber Association, made at its recent annual meeting. World stocks, he said, were steadily moving down, and if the present rate of consumption continues, much larger exports will have to be permitted in the near future.

Referring to war risks generally, Mr. Thompson said that at present sellers had to bear the bulk of the war risk charges under the London contract, and the whole of them, under the New York C.I.F. contract. This policy was unfair, and the question of a more equitable distribution of these charges had been taken up with both the Rubber Traders' Association of London and the Rubber Trade Association of New York.

The chairman also mentioned that he had noticed much slackness both in the packing and the grading of rubber by local companies; this must be corrected, he warned, if Malaya was to retain its good name in the consuming markets.

Company Reports

Recent reports of various rubber companies show severe curtailment of profits in many cases, the result of the lower prices and drastically reduced exportable percentage. Changkat Serdang earned $16,525, against $54,848 in 1937, and the dividend was 2½% instead of 10%. Kuala Sidim, which paid 30% for 1937, paid 10% for 1938, as profits fell from $230,866 to $60,881. Ulu Benut Consolidated passed its dividend; profits were $10,829, against $43,719. Ulu Simpan Rubber profits dropped from $85,308 to $6,732, and the dividend from 15% to 1½%. Bassett Rubber earned $56,711 in 1937 and only $2,727 last year. This story is repeated over and over again, except in a few instances where good forward sales helped to maintain profits nearer the 1937 level.

As the increasing demand for submarine cable has caused renewed interest in the production of gutta percha, and as its manufacture was resumed last year, the plantations of Selborne Estate, Malaya, owned by the Telegraph Construction & Maintenance Co., Ltd., London, and kept on a care and maintenance basis for several years, are expected soon to be in full production.

Ayer Panas Rubber, Ltd., and two other rubber companies of the Sime Darby group have formed a new rubber planting company to be known as the Russell Plantations, Ltd., which has acquired land near Paloh, Johore, one of the most fertile districts in the country, and it is expected that 1,000 acres will be planted to rubber this year.

During the fiscal year ended October, 1938, Dunlop Plantations, Ltd., now taken over by the newly formed Dunlop Malayan Estates, Ltd., brought 4,598 acres of budded rubber into tapping, and practically the whole of the remainder of the budded area is to come into tapping before the end of the current business year. The Dunlop rubber estates, with a total planted area of more than 85,000 acres, is one of the largest rubber growing enterprises in the world. The rubber produced is no longer all taken by the Dunlop Rubber Co.; instead most of it is sold in the form of latex to consumers all over the world.

Caledonia (Selangor) Rubber Co. is to acquire its subsidiary, Ulu Caledonian, for £33,372, to be paid in the form of 266,976 Caledonia (Selangor) 2s. shares, at a premium of 6d. per share. This transaction will give the main company a total of 3,144 acres, of which about 2,893 are planted to rubber. The company's issued capital will be raised to £84,910, which works out at around £29 10s. per planted area.

Latex Business Down

In the thirtieth annual report the Rubber Growers' Association reveals a considerable decline in latex exports and imports, but it is added that work on the extended use of latex continues so that the reduction may be considered merely temporary.

In the monthly statistics issued by the Registrar General of Statistics, S.S. and F.M.S., latex is now classified as follows: "A," latex under 50% D.R.C.; "B," latex over 50% and under 62% D.R.C.; and "C," latex over 62%.

NETHERLAND INDIA

Warns on Synthetics

Dr. R. Houwink, general director of the Rubber Foundation, Amsterdam, now in Netherland India, at a recent joint meeting of the executive committee of the Union of Netherlands Indian Rubber Estate Owners and the Rubber Sales Promotion Commission spoke on synthetic rubbers and demonstrated their possibilities, explaining in what respects they were superior to natural rubber. Dr. Houwink concluded by indicating measures which could and should be taken by rubber producers to meet the danger of synthetic rubber competition.

Rubber Remilling

The Native Rubber Report for the second half of 1938 shows that while the remilling factories in Netherland India have a combined capacity for treating about 92,500 tons of rubber annually, they actually operated at an average of 70% capacity. The percentage of production, as compared with capacity, varied considerably in the different districts. Thus Palembang in Sumatra has six plants with a total capacity of 17,800 tons and turned out 96%; the ten plants of South and East Borneo, total capacity, 16,400 tons, turned out 83%; but West Borneo, with a capacity of 21,150 tons, utilized only 60% and the four plants of Djambi, Sumatra, capacity, 8,700 tons, utilized under 52%. On the whole, however, there was comparatively greater interest in rubber remilling during 1938 than in 1937. For although the quantity of remilled blanket exported in 1938 came to 64,803 tons, against 72,455 tons, there was an increase in the percentage of total native exports shipped in the form of blankets.

This trend was due to the fact that at present market prices the difference in price between sheet and slab is too small to encourage natives to produce the former. Another reason given is that owners of remilling factories are anxious to continue operations as long as possible in view of the heavy capital investment and the relatively high fixed charges of the industry.

Rubber Exports

The Central Bureau of Statistics reported February rubber exports from Netherland India totaled 25,446,547 kilos. Estate rubber from Java and Madura accounted for 4,961,124 kilos, including 49,763 kilos in the form of rubber goods and 29,108 kilos latex. Estate rubber from the Outer Provinces came to 8,948,600 kilos, including 1,080,797 kilos latex; native rubber shipments from the Outer Provinces totaled 11,536,823 kilos.

Gas Mask Factory

The Singapore Rubber Works soon will open its new gas mask factory at Bandoeng. At present an annual production of 9,000 masks has been guaranteed by contract with the Netherland India Army. The factory undertakes to work at full capacity in time of war after one month's notice.

Rubber Industry in Europe

GREAT BRITAIN

Imports and Exports

Imports of crude rubber and latex into the United Kingdom in the first quarter of 1939 were 612,898 centals of 100 pounds, against 1,229,742 centals in the corresponding period of 1938. Half of the 1939 arrivals was reexported, and the total amount of rubber retained in the period was only about one-third the amount retained in 1938.

Both imports and exports of tires and tubes increased, imports from 102,943 to 179,023 units. Exports of outer covers for automobiles came to 332,423 against 278,889. The increase here was chiefly due to greater purchases by British countries; exports to Netherlands, France, and the Argentine showed steep reductions. Exports of other pneumatic tires were 1,060,177 against 848,770, and other tubes, 767,225 against 642,996.

Footwear imports continue to rise: in the first quarter of 1937 they were 251,574 dozen pairs; in 1938, 316,146 dozen pairs; and in 1939, 356,281 dozen pairs. Exports in the corresponding periods were 12,089 dozen pairs, 14,496 dozen pairs, and 14,219 dozen pairs, respectively. Exports of rubber and canvas belting fell from £79,740 to £77,331.

Rubber Publicity Report

The British Rubber Publicity Association, incorporated on April 20, 1938, and one of the organizations formed under the International Rubber Regulation Scheme for conducting research and propaganda for rubber, has issued its first report, which among other things, states that the problem of producing suitable rubber floorings for cowstalls and piggeries at low cost has not yet been solved. The association undertook no new experiments in this direction last year, but regularly inspected the experimental sections of rubber blocks, rubber mats, and various types of plastic rubber floors already laid under the auspices of the Propaganda Committee of the Rubber Growers' Association. It was found that while the rubber blocks and mats give good service, jointing methods cause minor difficulties when the former were used and that both types of flooring are too expensive for general use. Most of the plastic materials have proved disappointing and have had to be removed after a short time, although one type has given good service for two years.

In connection with propaganda, efforts to increase the use of pneumatic tires for bullock carts, especially in India, are being continued; it is also intended to study means of increasing the use of rubber in households.

Colwyn Medal

At the annual dinner of the Institution of the Rubber Industry, on May 17, Sir Walrond Sinclair, president-elect, presented the Colwyn Gold Medal to Dr. S. S. Pickles. The medal, instituted by Lord Colwyn in 1927, is awarded by the I. R. I. for conspicuous services of a scientific or technical character. Dr. Pickles, a fellow, vice president, and honorable technical adviser of the I. R. I., is a member of the Examinations Board, has presided over several committees of the Research Association of British Rubber Manufacturers and was for several years chairman of its Library Committee, and is also a fellow of the Institute of Chemistry and of the Chemical Society.

New Medal Award

The Committee of the Scottish Section of the Institution of the Rubber Industry is to present a silver medal for the best paper submitted by a member of the Scottish Section or any present or former pupil of the Rubber Technology Classes of Stow College, Glasgow. Competitors must be under 30 years and must send in their papers on or before January 26, 1940. The paper may be in the form of a report on original work, or a review or examination of an already published work, or a discussion of any subject directly connected with the rubber industry.

R.G.A. Report

The Thirtieth Report of the Council of the Rubber Growers' Association reveals that at the general meeting on April 21 F. E. Maguire was to be elected chairman for the ensuing year, and T. Taylor, vice chairman. The association has 1,092 members, consisting of 603 rubber companies, 22 companies not directly owning rubber estates, six trust companies, and 461 individuals. The 603 rubber companies have a combined capital of £150,330,951, the issued capital amounting to £118,107,301; they own altogether 3,605,495 acres of land of which 2,085,750 acres are planted or interplanted with rubber. Considerably more than half the companies are in Malaya.

North British-Dominion

An arrangement has just been made between the North British Rubber Co., Edinburgh, and the Dominion Tire Co., a subsidiary of the United States Rubber Co., 1790 Broadway, New York, N. Y., U. S. A., which it is hoped will not only benefit the companies concerned, but will have a stimulating effect on the tire and general rubber goods manufacture of Edinburgh as a whole. The North British Rubber Co. is to manufacture Dominion tires for the local market and to further this, existing factories are being extended and modernized under the supervision of engineers sent over by the American company. Personnel will have to be substantially increased. The new methods are expected to lead to improvement and greater efficiency in the production of all other rubber goods manufactured by the firm as well as tires.

The North British Rubber Co., Ltd., founded in 1888, took over a firm established in 1857 and now controls various other concerns including the British Rubber & Associated Productions Ltd., North British Rubber Co., (Continental) Ltd., North British Properties (London) Ltd., and the Veltex Shoe Mfg. Co., Ltd. The authorized capital is £1,000,000, and issued capital, £725,000.

The company's report for 1938 shows that its business was adversely affected by price cutting in rubber footwear and by the heavy imports of these goods from Hong Kong and Canada. Efforts are being made to have exports from these sources limited for a certain period. The company's trading profits during 1938 amounted to £39,045.

SWEDEN

Firestone Tire & Rubber Co., Akron, O., finally concluded arrangements for the manufacture of its tires in Sweden by the Skandinaviske Gummi Fabriks A.B., Viskafors. The Swedish works, already making tires for Fisk Rubber Corp., Chicopee Falls, Mass., is to be expanded and modernized. Firestone is supplying special machinery.

The American Consulate at Stockholm reports that still another American rubber manufacturer has arranged to operate in Sweden. This firm, to take over the Trelleborg Gummifabriks A.B., Trelleborg, producer of tires and footwear, will modernize the plant and increase its capacity.

GERMANY

New Decrees

According to an order of May 2, 1939, it is forbidden, until December 31, 1942, to start new, or to expand existing, factories for the production of rubber soles, without special permission. Nor may establishments not producing rubber soles since May 9, 1934, resume before the date given. By rubber soles are understood soles molded or cut from sheet which consists wholly or in part of natural rubber, synthetic rubber, waste, old rubber or reclaim. Another order, effective March 31, 1939, removes the duty on all rubber goods, except heels, soles, and all tires (excluding tires for baby carriages) entering the Ostmark, formerly Austria. These goods may now be supplied in any quantity.

Research Institutions

A German Institute for Synthetics is to be established at Frankfurt a.M., to be, it is claimed, the first such institute in the world. The Dechema, German Society for Chemical Plant and Apparatus, which has transferred headquarters from Berlin to Frankfurt a.M., has created a Research and Consultation Bureau there for physico-chemical factory control and laboratory technique. The undertaking, under Dr. P. Wulff, is to promote cooperation between chemists and engineers.

Buna Factory Completed

The completion of the large Buna works at Schkopau was celebrated on April 29 by a large gathering of prominent personages. The present extensive works were built around the first experimental establishment which was completed 10 months after inception in April, 1936. Dr. Wulff, the manager, was formerly with the Technical Institute in Hannover and then with the Coal Research Institute of the Kaiser-Wilhelm Gesellschaft in Breslau. He joined the I. G. Farbenindustrie in 1929.

Continental and Semperit

Continental Gummi-Werke A.G., Hannover, recently revealed that it and the Semperit concern of Vienna have agreed to cooperate, thus removing competition between the two firms, which is expected to benefit both firms in the export field. They are to exchange formulae, and the Vienna company is to adopt Continental methods through the use of loaned technical experts who will attempt to increase capacity, reduce costs, and will give instruction in the use of Buna and other new materials. The agreement, it is said, will in no way interfere with the independence of Semperit.

The latter's 1938 report shows a considerable increase in output and sales since April, 1938; the number of workers was greatly increased, and at present about 8,700 persons are employed at Vienna and Emgerau. Semperit's capital, 16,000,000 schilling, has been converted to marks at the rate of 500 marks per 800 schilling, and is now, therefore, 10,000,000 marks.

Training Technologists

In order to speed up the training of young chemists and engineers for the rubber industry, the Berlin Technical Institute is offering to students in their final year special courses of lectures dealing with the properties and manufacture of rubber. A series of ten lectures is to be given on Mondays during the period May 8 to July 24, 1939. The Hamburg District Group of the Deutsche Kautschuk Gesellschaft is also giving lectures on rubber to young men who may be interested; the first was on March 20, 1939. The speakers are to be factory managers from the soft and hard rubber, reclaim, and factice works in the Hamburg district.

BELGIUM

Englebert Fils & Cie., Liege, reports net profits during 1938 of 6,280,000 francs, against 2,690,000 in 1937, although the gross business dropped.

Manufacture d'Amiante & de Caoutchouc, Brussels, made net profits of 775,330 francs, against 1,024,944 francs the year before; capital 8,000,000 francs.

During 1938, imports of tires into Belgium were 11,379 quintals against 15,598 in 1937, but exports were 83,795 quintals in 1938 against 79,841 in 1937. Lower imports were chiefly from the United Kingdom and Italy, although the former still has the greatest share of this business. Germany substantially increased her tire sales to Belgium in 1938. Belgian tire requirements are chiefly supplied by the local Englebert and Michelin companies. The latter is said to have a capacity of 400 to 600 tires daily; Englebert has a daily capacity of about 4,000 units, but in 1938 averaged only 2,000.

The Belgian Association of Technicians has organized an International Congress of Rubber and Plastics scheduled for June 15 at the International Exhibition of Liege, which commemorates the opening of the new Albert Canal and is being held from May to November, 1939.

POLAND

Recent press reports indicate the Chemical Works, Dembica, Poland, marketed the first locally produced synthetic rubber at the beginning of November, 1938. The product, said to be of good quality, at present is used chiefly by tire manufacturers, especially the Stomil works.

The Polish Englebert rubber company in Warsaw reports net profits of 4,838 zloty for the past business year on a capital of 250,000 zloty.

EIRE

From April 1 through September 30, 1939, import quotas of 5,000 pairs of canvas footwear with rubber soles and heels and 50,000 pairs of other rubber footwear may be imported into Eire under orders dated February 28, according to the American Consulate General, Dublin, March 27.

FRANCE

French pneumatic tires exports rose from 80,075 quintals, value 147,756,000 francs in 1937 to 85,748 quintals, value 193,678,000 francs, in 1938, principally owing to heavier shipments to French colonies and the Netherlands; but exports to Belgium, Luxemburg, and West Equatorial Africa fell sharply. Cycle tires exports declined in quantity from 13,198 to 11,448 quintals but the value rose from 22,702,000 to 23,001,000 francs. The increase to French colonies was more than offset by the reduction to foreign countries. Footwear exports in 1938 were 8,743 quintals, value 14,527,000 francs, against 4,746 quintals, value 7,121,000 francs, in 1937.

KENYA

Bata is said to have ambitious plans with regard to the African market for footwear. It is erecting a factory at Kenya and importing machinery from Europe for manufacturing low-priced canvas shoes, now supplied by Japan at the rate of almost 1,000,000 pairs annually. Then boots and shoes are to be produced from East African hide with African labor. The main office for Africa is to be established at Nairobi, and from here all Bata branches in Africa, from the Cape to Cairo, are to be administered.

JAPAN

After having reached the record figure of 52,512,851 yen in 1937, Japanese exports dropped suddenly to the lowest amounts in years. This change, noted in the first half of 1938, was further accentuated in the second half of the year when exports, at 15,743,907 yen, declined 15.3% from the already low total of the preceding six months, and showed a loss of 36.2% as compared with the total for the second half of 1937. The exports for the whole of 1938 were 34.6% below those for all of 1937, decreases being noted chiefly in footwear, tires and tubes, and rubber toys, and to a lesser degree, in miscellaneous rubber goods.

The following table clearly shows the decline in Japan's rubber goods exports.

EXPORTS OF RUBBER MANUFACTURES, YEN

	First Half	Second Half	Full Year
1935.....	21,983,385	19,833,286	41.816,671
1936.....	20,573,067	19,950,772	40.523,839
1937.....	27,824,046	24,688,805	52,512,851
1938.....	18,590,351	15,743,907	34,334,258

Editor's Book Table

NEW PUBLICATIONS

"Goodrich Chexall Accessory Blue Book." 1939 Edition. B. F. Goodrich Co., Akron, O. 430 pages. This book contains complete accessory specifications and replacement data on popular light trucks and passenger cars. Inspection and installation instructions, display and merchandising helps, and cross-reference tables are also included.

"Monsanto Review for 1938." Monsanto Chemical Co., St. Louis, Mo. 20 pages. Directed to Monsanto employes, this review includes all the important facts contained in the annual report to stockholders. The data, illustrated by descriptive charts, include a balance sheet which discloses the distribution of money for payrolls, taxes, dividends, etc.

"Presenting Dunlop Sporting Goods for 1939." Dunlop Tire & Rubber Corp., Sporting Goods Division, 500 Fifth Ave., New York, N. Y. Illustrated. By way of presenting the firm's line of golf and tennis equipment, this catalog also contains the story of the manufacture of Dunlop golf and tennis balls and tennis rackets. Each subject is treated individually and is profusely illustrated with photographs of the manufacturing processes.

"Hose Catalog." The DeVilbiss Co., Toledo, O. 25 pages. Illustrated. This new catalog contains full information on the firm's complete line of hose for all requirements, as well as hose connections, valves, couplings, and adapters. Full specifications are listed with each type of hose illustrated, besides much valuable information to aid in the selection of the right hose for the right job.

"Rubber and the Goodyear Plantations." Hugh Allen. Published by The Goodyear Tire & Rubber Co., Akron, O. 32 pages. This is a copiously illustrated story of the growing and preparation of rubber in Africa, South America, and the Far East. The pamphlet gives a generally complete survey of the important part played by such persons as Wickham and others in the early development of rubber in these countries. Also, it discusses the Stevenson Act and the other restriction schemes figuring in the later development of crude rubber plantations. The reader is taken on a tour of the Goodyear plantations and is given an insight into the daily activity to be found on a typical plantation. This little pamphlet should be a great help to all those desiring a superficial knowledge of the story of rubber.

"Neville Coal-Tar Products." The Neville Co., Pittsburgh, Pa. 8 pages. This booklet presents briefly the uses and basic properties of the firm's line of synthetic resins, solvents, oils, plasticizers, tar products, and specialty products.

"Hewitt Magazine." Hewitt Rubber Corp., Buffalo, N. Y. 16 pages. This is the first issue of a new quarterly house organ designed to be a common meeting ground for company information, experiences, and enthusiasm. One of the features of each issue will be a pictorial article devoted to some phase of industrial rubber goods manufacture. The present issue, which appears at a time when Hewitt is celebrating its eightieth anniversary, features a story of Hewitt progress since the inception of the parent company in 1859 and a complete listing of present Hewitt employes. In addition the magazine presents illustrated information on the firm's hose, belts, and employe activities.

"Selected Information on Manufacturers of Tires and Other Rubber Products Registered under the Securities Exchange Act of 1934 at June 30, 1938." Securities and Exchange Commission, Washington, D. C. 72 pages. This report, the fifth of a series, contains a summary of selected data on 18 manufacturers of tires and other rubber products. It provides individual data for each of the companies and also combined data for all companies in the group. Included in the data on individual companies are: a general survey, names of parents and subsidiaries, outstanding security issues, financial and operating ratios, salary data, and individual balance sheets, profit and loss statements, and surplus reconciliations. The combined data for the group as a whole include a balance sheet, a profit and loss statement, a surplus reconciliation, totals of selected expense items, and 16 financial and operating ratios. Several minor inaccuracies and omissions have been noted in these data. Copies of the report are available upon request to the Publications Unit of the Securities and Exchange Commission, Washington, D. C.

"Mathews Conveyers Handbook." Mathews Conveyer Co., Ellwood City, Pa. 384 pages. Considerable engineering data and drawings are furnished in this handbook on the company's line of conveying equipment. Roller, wheel, belt, chain, trolley, and elevating conveyers are among the types covered.

BOOK REVIEWS

"Wheels of Fortune. A Salute to Pioneers." Sir Arthur du Cros. Afterword by Arthur Roy du Cros. Chapman & Hall, Ltd., 11 Henrietta St., London, W. C. 2, England. Cloth, 5½ by 8½ inches, 316 pages. Illustrated. Index. Price 10s. 6d.

This book intimately reveals from behind the scenes the history of the invention of the pneumatic tire and the founding, 50 years ago, of one of the world's greatest industries. The author, one of the seven sons of the man who founded the original Dunlop Tyre Co., has written his book to honor the memory of Robert William Thomson, inventor of the pneumatic tire in 1845; John Boyd Dunlop, who in 1888 successfully applied the pneumatic principle to the wheels of cycles; Charles Kingston Welch and William Erskine Bartlett, who by their inventions of 1890 made pneumatic tires detachable and practicable for all forms of transport; and William Harvey du Cros, of Dublin, who allied invention with commerce and thereby founded the world-wide tire industry.

The story, which strikes a pleasing balance between the technical accuracy of legal and scientific history and the more intimate style of personal reminiscence, sheds much light on the early struggles of the pioneers of the tire industry. Full details of the invention and re-invention of the pneumatic are given as well as subsequent developments, both legal and financial, which had a direct bearing on the commercial utilization of the tire. The book also brings in many interesting phases of the early days of steam coaches, hobby horses, bicycles, and automobiles. The author pays tribute to and recognizes the contributions of many of the less generally known figures connected with the beginning of the tire industry.

"Commodity Year Book—1939." Compiled and published by Commodity Research Bureau, Inc., 82 Beaver St., New York, N. Y. Cloth, 8½ by 11 inches, 624 pages. Indexed. Price $7.50.

This book, which is to be published annually, is designed to fill a definite need for a comprehensive up-to-date reference on the many important commodities entering into commerce and industry. Other publications in the past have dealt with an individual commodity or group, but the present work is the first to include all of the leading commodities. The 1939 edition combines in one volume a statistical reference work, a raw material encyclopedia, and nine fact-finding studies on major

(*Continued on page* 80)

Patents and Trade Marks

MACHINERY

United States

21,063. (Reissue.) **Ball Mold.** W. J. Voit, Los Angeles, Calif.
2,154,675. **Yarn Making Apparatus.** B. H. Foster, Maplewood, N. J., assignor, by Mesne assignments, to United States Rubber Co., New York, N. Y.
2,154,791. **Strip Guide for Molding Apparatus.** A. L. Wallace, Northport, N. Y.
2,155,528. **Balancing Machine.** C. C. Cadden, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
2,155,906. **Vulcanizer.** E. D. Rihn, Ford City, and E. D. Odenbaugh, Jr., Wilkinsburg, both in Pa., assignors, by mesne assignments, to C. E. Gross.
2,155,977. **Stripping Machine.** S. S. Millen, Glendale, assignor to J. Schmid, Beverly Hills, both in Calif.
2,156,188. **Vulcanizer.** H. Meyer, Sr., Hannover, Germany.
2,156,877. **Compression Tester.** E. Simpson, A. J. Stubbs, and T. Norcross, all of Birmingham, England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.
2,156,896. **Ball Winder.** F. Honig, Pawtucket, R. I.
2,157,054. **Container Making Apparatus.** J. R. Gammeter, Akron, O., assignor to United States Rubber Co., New York, N. Y.
2,157,092. **Fabric Tester.** R. W. Allen and T. A. Te Grotenhuis, assignors to Firestone Tire & Rubber Co., all of Akron, O.
2,157,580. **Ball Mold.** W. J. Voit, Los Angeles, and L. C. Weimer, Southgate, assignors, by mesne assignments, to W. J. Voit, Los Angeles, both in Calif.
2,157,967. **Tire Retreader.** A. Riccio, Brooklyn, N. Y., assignor to Vulcan Products Corp., a corporation of Del.
2,158,011. **Bead Forming Machine.** S. S. Millen, Glendale, assignor to J. Schmid, Beverly Hills, both in Calif.

Dominion of Canada

379,615. **Elastic Fabric Apparatus.** F. F. Schwartz and M. A. Chavannes, co-inventors, both of Paris, France.
380,827. **Plastic Blank Cutter.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of F. Zonino, Naugatuck, Conn., U. S. A.
381,334. **Thread Cutter.** H. H. Straus, New York, N. Y., U. S. A., assignee of E. Vincke, Palamos, Barcelona, Spain.

United Kingdom

498,266. **Sponge Rubber Mold.** H. R. Minor.
499,286. **Tire Tread Producing Machine.** Fisk Rubber Corp.
499,294. **Tire Mold and Retreader.** H. Simon, Ltd., (P. E. Hawkinson).
499,300. **Rotary Cutter.** United States Rubber Products, Inc.

PROCESS

United States

21,065. (Reissue.) **Sheet Rubber Dispensing Device.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.
2,154,612. **Rubber Sole and Heel Combination.** C. D. Garbutt, Revere, Mass.
2,154,834. **Rubber Coated Object.** W. W. De Lamatter, Cleveland Hts., O.
2,154,894. **Reclaiming Vulcanized Rubber.** W. G. Essex, Southport, England.
2,155,429. **Molding Cork Products.** M. Levin, Buffalo, assignor of fourtenths to J. T. Basseches, New York, both in N. Y.
2,155,597. **Stretchable Composite Sheet Material.** L. H. L'Hollier, Waltham, and F. Wray, assignors to Hood Rubber Co., Inc., both of Watertown, both in Mass.
2,155,621. **Rubber Thread.** T. L. Shepherd, London, England.
2,156,238. **Hats, Caps, Etc.** H. Frankmann and H. Haakh, Vienna, Ger.
2,156,335. **Adhesive Tape.** L. W. Geller, Astoria, assignor, by direct and mesne assignments of one-half to N. J. Fonarow and one-half to E. J. Carter, both of New York, N. Y.
2,156,353. **Cable Conveyer.** W. B. Ranney, assignor to W. Wrigley Jr., Co., both of Chicago, Ill.
2,156,508. **Sponge Rubber.** H. R. Minor, assignor to Industrial Process Corp., both of Dayton, O.
2,156,909. **Fabricating Rubber Strips.** L. C. Boyer, Toledo, O.
2,157,093. **Coupling.** H. P. Bemis, Newton Center, Mass., assignor to Firestone Tire & Rubber Co., Akron, O.
2,157,183. **Patch.** T. W. Mullen, assignor to Bowes Seal Fast Corp., both of Indianapolis, Ind.
2,157,243. **Sponge Rubber.** H. R. Minor, assignor to Industrial Process Corp., both of Dayton, O.
2,157,463. **Rubber Thread.** T. L. Shepherd, London, England.

Dominion of Canada

380,719. **Spinning Method.** H. Dreyfus, London, assignee of R. P. Roberts and R. McV. Dingley, co-inventors, both of Spondon, England.
380,844. **Abrasive Wheel.** Norton Co., Worcester, assignee of P. Johanson, Boylston, both in Mass., U. S. A.
380,942. **Printing Plate Treating Method.** Bomac Electrotype Co., Ltd., Toronto, Ont., assignee of E. L. Crist, Dayton, O., U. S. A.
380,956. **Coating Fabric.** Canadian Industries, Ltd., Montreal, P. Q., assignee of D. J. Sullivan, Fairfield, Conn., U. S. A.
380,979. **Protecting Pipe Line.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of H. F. Gremmel, Rutherford, N. J., and H. deB. Rice, Barrington, R. I., co-inventors, both in the U. S. A.
380,992. **Rubber Processing.** Industrial Process Corp., assignee of H. R. Minor, both of Dayton, O., U. S. A.
381,157. **Sheet Rubber Dispensing Device.** Copeman Laboratories Co., assignee of L. G. Copeman, both of Flint, Mich., U. S. A.
381,218. **Shirt Manufacture.** T. L. Shepherd, London, England.
381,301. **Abrasive Wheel.** Norton Co., Worcester, assignee of M. B. Lane, Holden, both in Mass., U. S. A.

United Kingdom

498,196. **Ball.** M. B. Reach.
498,507. **Tire.** E. W. Witt.
498,823. **Dart Flight.** A. S. Lancaster.
498,851 and 498,852. **Rubber Thread.** International Latex Processes, Ltd., R. G. James, and S. F. Smith.
498,881. **Gas Mask Eyepieces.** Romac Motor Accessories, Ltd., and R. D. Boyce.
498,901. **Gas Masks.** Romac Motor Accessories, Ltd., and R. D. Boyce.
499,564. **Coupling.** British Thomson-Houston Co., Ltd.
499,567. **Motor Tire Splitting.** A. J. Stikkel and D. J. Van Wijngaarden.
499,625. **Label.** United States Rubber Products, Inc.
500,000. **Capsules.** W. W. Triggs, (Surgident, Ltd.).

Germany

673,882. **Rubber-insulated Conductors.** Allgemeine Elektricitats Gesellschaft, Berlin.
674,480. **Rubber Thread.** Ungarische Gummiwaarenfabriks A.G., Budapest, Hungary. Represented by J. Reitstotter, Berlin.
674,622. **Fabrics Coated with Rubber or Waterproof Masses.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, Berlin.

CHEMICAL

United States

2,154,798. **Gum Adhesive.** H. A. Winkelmann, Chicago, and J. P. McKenzie, Evanston, assignors to Marbon Corp., Chicago, both in Ill.
2,154,837. **Rubber Colors.** E. Fischer, Offenbach a.M., Germany, assignor to General Aniline Works, Inc., New York, N. Y.
2,154,852. **Artificial Rubber.** E. Kleiber, Lugano Via Trevano, assignor to Hevapar S. A., Geneva, both in Switzerland.
2,155,539. **Metallic Phthalate-Rubber Composition.** H. A. Gardner, Washington, D. C.
2,155,590 and 2,155,591. **Plasticizer.** B. S. Garvey, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
2,155,639. **Rubber-like Material.** T. F. Bradley, Westfield, N. J., assignor to American Cyanamid Co., New York.

2,156,455. **Chlorinated Rubber-Felt Compositions.** J. Kleine, Dessau, and W. Brennecke, Dormagen, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

2,156,755. **Parchment Coating Composition.** E. Gebauer-Fuelnegg, deceased, late of Evanston, Ill., by M. Gebauer-Fuelnegg, administratrix, Evanston, and E. W. Moffett, Chicago, both in Ill., assignors, by mesne assignments, to Marbo Patents, Inc., a corporation of Del.

2,156,956. **Synthetic Rubber-like Compositions.** M. C. Agens, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,157,997. **Polyvinyl Halides.** S. L. Brous, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,158,019. **Vulcanizing Agent.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,158,021. **Vulcanizing Agent.** J. G. Lichty, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,158,022. **Accelerator.** J. G. Lichty, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

Dominion of Canada

380,832. **Polymerized Butadienes.** I. G. Farbenindustrie A.G., Frankfurt A.M., assignee to O. Nicodemus, H. Lange, and O. Horn, co-inventors, all of Frankfurt a.M.-Hochst, both in Germany.

381,160. **Accelerator.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of L. Meuser, Naugatuck, Conn., U. S. A.

United Kingdom

498,256. **Rubber-Metal Bonding Agent.** Dunlop Rubber Co., Ltd., D. F. Twiss, and F. A. Jones.

498,311. **Rubber Derivatives.** Albert Products, Ltd.

498,737. **Rubber Conversion Products.** R. J. Reaney.

498,754. **Latex Impregnating Compositions.** J. Klasi.

498,858. **Chlorinated Rubber Insulating Composition.** L. T. Dod, C. I. Snow, and Imperial Chemical Industries, Ltd.

498,989. **Chlorinated Rubber Coating Compositions.** J. R. Geigy A.G.

499,392. **Rubber Lacquer.** Vereenigd Industrieel Bezit Veritex, N. V.

499,550. **Halogenated Rubber.** British Rubber Producers Research Association, H. P. Stevens, and F. J. W. Popham.

499,559. **Cellular Rubber.** United States Rubber Products, Inc.

499,578. **Latex Preservative.** United States Rubber Products, Inc.

499,747. **Olefine Polysulphide Coating Composition.** A. Carpmael, (I. G. Farbenindustrie A.G.).

499,908. **Insulating Compositions.** W. J. Henley's Telegraph Works Ltd., W. C. Barry, and B. B. Evans.

499,935. **Tetra-Alkyl Thiuram Monosulphides.** United States Rubber Products, Inc.

499,958. **Artificial Rubber.** A. Wassermann.

Germany

673,747. **Factice.** Dr. Alexander & Posnansky, Berlin-Kopenick.

674,549. **Increasing Impermeability to Gases of Hot Cured Rubber.** Deutsche Dunlop Gummi-Compagnie A.G., Hanau a.M.

674,581. **Mixes from High Polymer Butadiene Hydrocarbons or High Polymer Vinyl Compounds with Blacks.** I. G. Farbenindustrie A.G., Frankfurt a.M.

674,774. **Mixes from Polymerous Chlorine-2-butadiene (1.3).** United States Rubber Co., New York, N. Y., U. S. A. Represented by W. Harmsen, Berlin.

674,857. **Stabilizing Solutions of Chlorinated Rubber.** I. G. Farbenindustrie A.G., Frankfurt a.M.

674,986. **Threads, Strips, Etc.** Metallgesellschaft A.G., Frankfurt a.M.

GENERAL

United States

21,075. (Reissue.) **Belt.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,154,551. **Stranded Conductor.** H. V. Wodtke, Marion, Ind., assignor to Anaconda Wire & Cable Co., New York, N. Y.

2,154,586. **Shock Absorber.** N. S. Stern, Leicester, England.

2,154,651. **Tool Retainer.** O. P. Wodack and H. M. Zschau, assignors to Wodack Electric Tool Corp., both of Chicago, Ill.

2,154,828. **Tire Interliner.** R. Ambuhl, Troy, N. Y.

2,154,841. **Battery.** W. L. Gill, Redlands, Calif.

2,154,846. **Massage Device.** G. H. Heymann, Louisville, and E. D. Rose, Bowling Green, both in Ky.

2,154,913. **Shoe Calk.** L. W. Nitkey, St. Maries, Ida.

2,154,941. **Atomizer.** J. Kampschulte, Osnabruck, Germany.

2,154,997. **Arch Support.** J. F. Schipper, Miami, Fla.

2,155,014. **Key Holder.** G. J. Howe, Grove City, Pa.

2,155,017. **Tire.** A. J. Kramer, Washington, D. C.

2,155,023. **Antisqueak Strip.** R. W. Springer, Detroit, Mich.

2,155,105. **Inner Tube.** H. M. Thiele, Milwaukee, Wis.

2,155,111. **Cream Separator.** H. T. Anderson, Le Feria, Tex.

2,155,155. **Railroad Tie Plate Arrangement.** T. W. Stedman, assignor, by mesne and direct assignments, to Resilient Products Corp., both of New York, N. Y.

2,155,166. **Footwear Tread Surface.** H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,155,169. **Adjustable Drawing Curve.** W. Moses, Cleveland, O.; M. B. Moses, owner by decree of court.

2,155,206. **Tire.** J. Steindel, E. Chicago, Ind.

2,155,286. **Toilet Seat and Cover.** B. Winding, Croton on Hudson, N. Y.

2,155,313. **Comb Package.** S. B. Jackson, Shawsheen Village, assignor to Bolta Co., Lawrence, both in Mass.

2,155,341. **Suction Mounting.** F. A. Wayne, Detroit, Mich.

2,155,441. **Towel.** B. Osborne, Detroit, Mich., assignor to N. H. Gerlach, as trustee.

2,155,462. **Windshield Cleaner.** J. W. Anderson, assignor to Productive Inventions, Inc., both of Gary, Ind.

2,155,485. **Corset.** M. S. Graves, Santa Barbara, Calif.

2,155,488. **Steering Wheel.** G. S. Hendrie, Grosse Pointe Farms, assignor to Detroit Macoid Corp., Detroit, both in Mich.

2,155,491. **Condenser Tube Seal.** F. C. Jacobs, New Kensington, Pa.

2,155,559. **Window Glass Run.** E. B. Lefevre, assignor to Detroit Gasket & Mfg. Co., both of Detroit, Mich.

2,155,564. **Wheel and Tire Assembly.** H. F. Schippel, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,155,711. **Hose Supporter.** W. E. Hatheway, Bridgeport, Conn.

2,155,829. **Furniture Slide, Caster, Etc.** W. F. Herold, assignor to Bassick Co., both of Bridgeport, Conn.

2,155,865. **Tire Pressure Indicator.** F. G. Leavenworth, Oak Park, and M. J. Green, assignors to W. Hartman, both of Chicago, both in Ill., trustee.

2,155,902. **Tank Ball Valve.** S. M. Kass, Philadelphia, Pa.

2,155,903. **Tire Pressure Indicator.** F. G. Leavenworth, Oak Park, assignor to W. Hartman, Chicago, both in Ill.

2,155,938. **Tractor Wheel.** K. Helgeson, Mt. Horeb, Wis.

2,155,964. **Insulated Strainer.** H. L. Bowers, Haworth, and N. E. Brice, Millburn, both in N. J., assignors to Permutit Co., New York, N. Y.

2,155,972. **Tire.** H. C. Hower, Chicago, Ill.

2,155,999. **Typewriter.** R. G. Thompson, W. Hartford, Conn., assignor to Underwood Elliott Fisher Co., New York, N. Y.

2,156,073. **Hair Curling Device.** F. C. Wallace and A. A. Leisy, both of Los Angeles, assignors to Hair Accessories, Inc., Los Angeles County, both in Calif.

2,156,112. **Liquid Dispenser.** T. J. Dykema, Pittsburgh, Pa.

2,156,175. **Pneumatic Boat.** L. A. Brown, Kansas City, Kans.

2,156,260. **Mortuary Device.** P. W. Crothers, assignor to Dr. G. H. Michel & Co., Inc., both of Cleveland, O.

2,156,301. **Cushion Support.** J. S. Loewus, Baltimore, Md.

2,156,332. **Elastic Yarn.** A. Coté, Montreal, P. Q., Canada, assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,156,380. **Adhesive Sheeting.** R. G. Drew, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn.

2,156,385. **Printing Roll.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,156,477. **Table Tennis Racket.** A. M. Keller, Salzburg-Aigenglas, Germany.

2,156,505 and 2,156,506. **Windshield Wiper.** L. Marcolivio, assignor to A. Romano, both of Providence, R. I.

2,156,530. **Protective Covering.** M. W. Freeman, Detroit, Mich.

2,156,573. **Doll.** E. G. Schaeffer, Brooklyn, assignor to American Character Doll Co., Inc., New York, both in N. Y.

2,156,604. **Pipe Joint.** C. R. Payne, Allentown, and G. L. Wirtz, Monterey, assignors to Atlas Mineral Products Co., Mertztown, all in Pa.

2,156,606. **Liquid Dispenser.** T. H. Tobertshaw, Cardiff, Wales.

2,156,664. **Resilient Cushion.** T. J. Litle, Jr., Detroit, Mich.

2,156,681. **Sealing Strip.** H. Dewhirst and E. Meyer, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,156,696. **Sandblast Shaping.** R. Knox,

Berlin, Vt., assignor to Jones Bros. Co., Boston, Mass.

2,156,852. **Gas Mask.** V. Horák, Prague, Czechoslovakia.

2,156,871. **Rubber Product.** H. J. Rittenhouse, assignor of one-half to F. H. Barth, both of Philadelphia, Pa.

2,157,004. **Tire Tread.** G. R. Nelson, Sr., Aimelund, Minn.

2,157,096. **Thermal Insulation.** H. W. Greenup, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,157,098. **Bearing.** H. Potter, assignor to Fafnir Bearing Co., both of New Britain, Conn.

2,157,106. **Fly Swatter.** D. Baker, assignor of one-half to A. N. Mumford, both of Portland, Ore.

2,157,151. **Tire Groover.** E. H. Stackhouse, W. Philadelphia, Pa.

2,157,235. **Detachable Heel and Sole.** B. T. Hewson, London, England.

2,157,250. **Carpet Cleaner.** J. K. Tingle, Connersville, Ind.

2,157,377. **Cable.** G. W. Zink, Stratford, Conn., assignor to Phelps Dodge Copper Products Corp., New York, N. Y.

2,157,418. **Spring Cover.** S. W. Lippitt, Cleveland, O.

2,157,422. **Corset.** S. T. Metz, assignor to Treo Co., Inc., both of Jamaica, N. Y.

2,157,440. **Printer's Roller.** J. Streckfus, L. Schmidt, and H. Godwin, all of Baltimore, Md.

2,157,443. **Tire Remover.** G. Van Zale, Bay City, Mich.

2,157,448. **Glider.** W. E. Back, Oulton Broad, England.

2,157,450. **Fountain Pen Eraser Attachment.** J. Cidissen, New York, N. Y.

2,157,464. **Elastic Strain Absorber.** H. B. Snader, Temple, assignor to Vanity Fair Silk Mills, Reading, both in Pa.

2,157,482. **Neck Band.** J. H. Crossingham, assignor to Mt. Airy Knitting Co., both of Mt. Airy, N. C.

2,157,503. **Syringe.** A. E. Smith, Los Angeles, Calif.

2,157,614. **Colonic Irrigator.** H. Lazarus, New York, N. Y.

2,157,624. **Vacuumizing Device for Containers.** G. J. Overmyer, Tulsa, Okla.

2,157,655. **Tire Alarm.** H. H. and L. J. Brandert, assignors of 25% to H. Truhlsen, all of Herman, Nebr.

2,157,738. **Lamp Guard and Handle.** F. C. Kollath, Chicago, Ill.

2,157,835. **Hat Retaining Device.** M. J. Solomons, New York, N. Y.

2,157,919. **Twin Contact Plug.** F. L. Reese, Philadelphia, Pa.

2,157,950. **Steering Wheel Cover.** F. A. Best, Windsor, Ont., Canada.

2,157,983. **Seal.** B. S. Glougie, assignor to Baldwin Rubber Co., both of Pontiac, Mich.

2,158,017. **Floor Covering.** W. S. Vrooman, assignor to Baldwin Rubber Co., both of Pontiac, Mich.

Dominion of Canada

380,590. **Breathing Apparatus.** R. H. Davis, London, England.

380,593. **Footwear.** Cambridge Rubber, Ltd., St. Remi de Napierville, P. Q., assignee of E. W. Dunbar, Hudson, Mass., U. S. A.

380,602. **Foodstuff Freezer and Preserver.** L. C. Hoveman, Paris, France.

380,610. **Manure or Seed Distributer.** J. H. Nitschke, Marton, Wellington, New Zealand.

380,646. **Wheel.** Clark Equipment Co., Buchanan, assignee of R. J. Burrows and A. O. Williams, co-inventors, both of Battle Creek, both in Mich., U. S. A.

380,658. **Tractor Wheel.** Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ont., assignee of J. W. Shields, Akron, O., U. S. A.

380,781. **Wheel Hub Cover.** B. Rodionoff, Oran, Algeria.

380,786. **Body Vibrator.** W. D. Spencer, Los Angeles, Calif., U. S. A.

380,842. **Grinding Wheel.** Norton Co., assignee of T. Larsson, both of Worcester, Mass., U. S. A.

380,845 and 380,846. **Grinding Wheel,** Norton Co., Worcester, assignee of M. B. Lane, Holden, both in Mass., U. S. A.

380,898. **Electric Circuit Controller.** H. E. Becker, Chicago, Ill., U. S. A.

380,909. **Mat.** R. Evraire, Eastview, Ont.

380,943. **Half-Axle Suspension.** Briggs Mfg. Co., Detroit, assignee of J. Tjaarda, Birmingham, both in Mich., U. S. A.

380,980. **Footwear.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of E. F. Roberts, Rye, N. Y., U. S. A., and A. G. McKinnon, Montreal, P. Q.

381,017 and 381,018. **Wheel Springing Element.** Transit Research Corp., assignee of E. H. Piron, both of New York, N. Y., U. S. A.

381,052. **Wheel.** Transit Research Corp., assignee of E. H. Piron, both of New York, N. Y., U. S. A.

381,067. **Resilient-Tired Wheel.** C. F. Barker and H. J. Pendray, co-inventors, both of Victoria, B. C.

381,110. **Gum Massager.** J. W. Vogan, Alvin, Tex., U. S. A.

381,143. **Polishing Disk.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of P. W. Dempsey, Pittsburgh, Pa., U. S. A.

381,165. **Rubber Sheet Material and Article.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of V. H. Hurt, Cranston, R. I., U. S. A.

United Kingdom

497,609. **Well Pipe Plug.** W. W. Triggs, (Hydril Co.).

497,769. **Wheel.** Dunlop Rubber Co., Ltd., C. E. Goodyear, and G. E. Sharp.

497,932. **Road Marker.** F. Morrish.

497,936. **Elastic Fabric.** H. A. and M. E. Smith.

498,121. **Vehicle Spring-Suspension.** Auto Union A.G.

498,141. **Vacuum Cleaner.** General Electric Co., and H. C. E. Jacoby.

498,147. **Casting Concrete in Situ.** T. C. Durley.

498,157. **Airscrew.** L. Metcalfe.

498,171. **Golf Ball.** E. Miller.

498,228. **Massage Apparatus.** F. Peters and R. Kuhlisch.

498,237. **Stamping Device.** R. Barlow and H. W. Cramer.

498,268. **Sponge Rubber Sheet.** H. R. Minor.

498,274. **Wheel.** L. R. Almandos.

498,375. **Advertisement Stand and Letter-Balance.** W. Jonas and K. Gutmann.

498,381. **Draught Excluder.** A. L. Woodward.

498,436. **Tire.** Michelin & Cie.

498,459. **Joint.** A. H. Stevens, (General Tire & Rubber Co.).

498,476. **Roller Skates.** H. T. Auerbach.

498,519. **Golf Appliance.** W. S. Peet and A. C. Bamford.

498,549 and 498,551. **Windscreen Cleaner.** Trico Products Corp. and E. C. Horton.

498,567. **Toy.** C. Arnold.

498,594. **Marking Machine.** British United Shoe Machinery Co., Ltd., (United Shoe Machinery Co., Ltd.).

498,613. **Motor Vehicle Body.** Leyland Motors, Ltd., and V. W. Pilkington.

498,623. **Tractor Wheel.** F. B. Knight and W. H. Bramble.

498,635. **Mask.** M. Riese.

498,638. **Wheel Tire.** R. Riehle.

498,668. **Tire.** Firestone Tire & Rubber Co., Ltd.

498,676. **Mine Props.** E. J. E. Boys.

498,729. **Switches.** Westinghouse Electric & Mfg. Co.

498,885. **Vehicle Spring-Suspension.** H. I. F. Evernden.

498,929. **Mop.** Briggs, Emmott & Co., Ltd., W. Banham, and G. B. Neal.

498,951. **Abrasive Wheel.** Norton Grinding Wheel Co., Ltd.

498,992. **Gas Excluder.** J. T. Newton.

499,019. **Door and Window Sealers.** J. T. Newton.

499,031. **Sifter and Strainer.** Nordberg Mfg. Co.

499,041. **Conveyer.** H. Hall and General Electric Co., Ltd.

499,062. **Windscreen Cleaner.** Trico Products Corp.

499,082. **Windshield Cleaner.** Zeiss Ikon A.G.

499,083. **Condenser.** Mallory Patents Holding Co., Ltd.

499,087. **Fountain Pen.** J. E. Pollak, (Sagren Corp.).

Germany

673,819. **Conveyer Belt.** Continental Gummi-Werke A.G., Hannover.

674,231. **Coupling.** Getefo Gesellschaft fur Technischen Fortschritt m.b.H., Berlin.

675,001. **Tire Cover.** Getefo Gesellschaft fur Technischen Fortschritt m.b.H., Berlin.

675,062. **Bathing Suit.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth, and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhorn, A. Mentzel, and P. Wirth, all of Berlin.

TRADE MARKS

United States

366,565. Representation of a label containing the word: **"Du Pont."** Tubing. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

366,609. **Dayton.** Cog belts. Dayton Rubber Mfg. Co., Dayton, O.

366,621. **Safti-Ride.** Tires and inner tubes. Federal Rubber Co., Chicago, Ill.

366,663. **Solvenized Rubber.** Camelback. Mohawk Rubber Co., Akron, O.

366,714. **Mile-Pak.** Tubes. Atlas Supply Co., Newark, N. J.

366,735. **Tru-Test.** Mechanical goods, tires and tubes. Tru Test Marketing & Merchandising Corp., Chicago, Ill.

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Mar. 25	Apr. 29	May 6	May 13	May 20
Apr.	16.01	.....	.....	.....	.....
May	.....	15.75	15.85	15.90	15.94
June	.....	15.80	15.91	15.92	15.97
July	16.04	15.85	15.98	15.95	16.00
Sept.	16.05	15.87	15.98	15.98	16.00
Dec.	16.05	15.94	16.00	16.00	16.05
Mar.	.....	15.93	16.02	16.03	16.09
Apr.	.....	.....	16.02	16.04	16.09
Volume per week (tons)	8,600	11,450	5,130	4,260	3,830

New York Quotations

New York outside market rubber quotations in cents per pound

	May 26, 1938	Apr. 25, 1939	May 24, 1939
Plantations			
Rubber latex..*gal.*	44/45	59/60	60/61
Paras			
Upriver fine	11½	13½	14⅜
Upriver fine	*15⅜	*16½	*17¼
Upriver coarse...	8	9¾	10
Upriver coarse...	*12	*14¾	*14¾
Islands fine.....	11	13¼	13¾
Islands fine.....	*14¾	*15¾	*16
Acre, Bolivian fine	11¾	13¾	14½
Acre, Bolivian fine	*15½	*16¾	*17½
Beni, Bolivian fine	12½	14¼	15
Madeira fine	11½	13½	14½
Caucho			
Upper ball.....	8¾	9¾	10
Upper ball.....	*12	*14¾	*14¾
Lower ball.....	8	9½	9¾
Pontianak			
Pressed block ...	11/28	8¾/15	9/16
Guayule			
Duro, washed and dried	10½	13	13
Ampar	11	13¼	13¼
Africans			
Rio Nuñez	13¼	14	14
Black Kassai	13¼	14	14
Prime Niger flake.	23	25	25
Gutta Percha			
Gutta Siak	13	9	9¼
Gutta Soh	16¾	15	14
Red Macassar ...	1.00/1.25	85/1.20	75/1.20
Balata			
Block, Ciudad Bolivar	..	..	..
Manaos block ...	27	30	30
Surinam sheets...	35	41	42
Amber	37	43	44

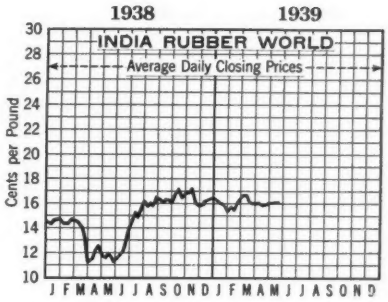
*Washed and dried crepe. Shipments from Brazil.

THE Commodity Exchange table published here shows prices of representative future contracts of the New York market for the last two months.

The rubber futures market held generally steady during May as has been the rule since last July. Since that time the market has lacked major gyrations, and the price has held within relatively narrow limits at 16¢ per pound. The price of September futures, which closed at 15.83¢ per pound on May 1, moved within a narrow range during the month and closed at the somewhat higher level of 16.40¢ per pound on May 26. With the exception of the export quota announcement for the third quarter, the market lacked major developments, and trading during the past month was light with buying interest lagging. Distant months moved somewhat higher than the nearby positions in regard to price. Trading in rubber on the Commodity Exchange will be suspended on Saturdays from May 27 to September 2, 1939, inclusive.

At its meeting on May 16 the International Rubber Regulation Committee raised the export quota for the third quarter of 1939 to 55% of basic quotas as compared with the current export quota of 50% which has been in force since the start of the year. This increase adds approximately 20,000 tons to potential crude rubber supplies during the third quarter and will tend to slow up the current decline in world stocks. Stocks in consuming countries, notably the United States, have been declining rapidly since the middle of last year. According to the *Statistical Bulletin of the International Rubber Regulation Committee,* world stocks of crude rubber outside of regulated areas amounted to 438,159 long tons at the end of March, 1939, as compared with 561,688 long tons at the end of March, 1938. The next meeting of the I.R.R.C. will be held on July 25.

Monthly world absorption during the first quarter of 1939 has averaged 88,356 long tons, an increase of 30.6% over the same period last year. The increase



New York Outside Market—Spot Ribbed Smoked Sheets

in this country amounted to 65.6%; while abroad the increase was only 6.0%. Significant increases have occurred in Russia, Canada, Germany, and China; while Japanese absorption has declined markedly.

New York Outside Market

The outside market ruled quiet during May, with little factory or shipment business being done. Shipment offerings from the Far East were scarce and generally too high for the local market.

The price of No. 1 ribbed smoked sheets, which closed at 15⅛¢ per pound on May 1, fluctuated within narrow limits during the month, closing at 16⅛¢ per pound on May 22. The closing price on May 26 was 16½¢ per pound.

The week-end closing prices on No. 1 ribbed smoked sheets follow: April 29, 16¢; May 6, 16⅛¢; May 13, 16⅛¢; May 20, 16⅛¢; and May 27, 16½¢.

London and Liverpool Stocks

Week Ended		Tons London	Tons Liverpool
April	29	44,718	23,812
May	6	44,527	22,793
May	13	43,477	22,500
May	20	43,040	21,893

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	April, 1939						May, 1939															
	24	25	26	27	28	29	1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20
No. 1 Ribbed Smoked sheet	15⅞	16	16 1/16	16 1/16	16⅛	16	15⅞	16 1/16	16 1/16	16	16 1/16	16 1/16	16 1/16	16 1/16	16 1/16	16⅛	16 1/16	16 1/16	16	16 1/16	16 1/16	16 1/16	16 1/16	16 1/16
No. 1 Thin Latex Crepe...	17⅝	17¾	17⅞	17⅞	17⅞	17⅝	17 3/16	17⅛	17⅛	17⅝	17⅛	17⅛	17⅛	17⅛	17⅛	17¾	17⅛	17⅛	17⅝	17⅜	17⅜	17¾	17¾	17¾
No, 2 Thick Latex Crepe..	18½	18⅝	18⅛	18⅛	18¾	18¾	18⅛	18⅛	18⅛	18¾	18⅛	18⅛	18⅛	18⅛	18⅛	18⅞	18⅛	18⅛	18¾	18 3/16	18 3/16	18⅞	18⅞	18⅞
No. 1 Brown Crepe.....	15⅝	15¾	15⅛	15⅛	15⅞	15⅝	15 3/16	15⅛	15⅛	15⅝	15⅛	15⅛	15⅛	15⅛	15⅛	15¾	15⅛	15⅛	15⅝	15⅛	15⅛	15⅛	15⅛	15⅛
No. 2 Brown Crepe.....	15½	15⅝	15⅛	15⅛	15¾	15½	15 1/16	15 1/16	15⅛	15½	15 1/16	15 1/16	15 1/16	15⅛	15⅛	15⅝	15 1/16	15 1/16	15½	15⅛	15⅛	15 1/16	15 1/16	15 1/16
No. 2 Amber.....	15⅝	15⅝	15⅛	15⅛	15¾	15⅝	15 1/16	15⅛	15⅛	15⅝	15⅛	15⅛	15⅛	15⅛	15⅛	15¾	15⅛	15⅛	15⅝	15⅛	15⅛	15⅛	15⅛	15⅛
No. 3 Amber.....	15½	15⅜	15 1/16	15 1/16	15½	15½	15 1/16	15 1/16	15⅛	15½	15 1/16	15 1/16	15 1/16	15⅛	15⅛	15⅝	15 1/16	15 1/16	15½	15⅛	15⅛	15 1/16	15 1/16	15 1/16
Rolled Brown	14⅜	14¼	14 1/16	14 1/16	14⅜	14¼	14 1/16	14 1/16	14 1/16	14¼	14 1/16	14 1/16	14 1/16	14 1/16	14 1/16	14⅜	14 1/16	14 1/16	14¼	14 1/16	14 1/16	14 1/16	14 1/16	14 1/16

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption¶ Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1936	490,858	575,000	223,000	56,567	78,462	26,969	857,900	1,044,695	538,028
1937	584,851	543,600	262,204	63,099	57,785	44,792	1,139,800	1,103,591	639,025
1938	400,178	437,031	231,500	45,105	86,853	27,084	894,309	917,485	595,246
1938									
Jan.	42,135	31,265	276,497	57,356	62,108	48,494	80,288	68,697	a634,330
Feb.	43,930	25,357	292,067	47,459	71,516	46,241	81,159	63,152	a653,791
Mar.	35,967	32,389	301,762	41,882	76,617	50,797	81,969	78,259	a670,332
Apr.	30,807	29,730	303,901	39,071	82,754	40,614	87,174	70,284	a668,440
May	27,410	30,753	300,907	32,859	87,215	40,598	65,092	76,980	a653,865
June	26,011	32,540	294,796	32,079	92,312	44,729	71,117	70,761	a670,068
July	22,918	34,219	282,785	40,400	95,252	45,529	80,120	72,241	a670,873
Aug.	31,099	40,552	273,841	47,772	99,614	41,002	75,172	73,529	a654,704
Sept.	37,374	40,183	268,094	48,927	98,140	35,386	71,151	77,954	a646,378
Oct.	34,496	42,850	259,074	51,062	93,272	34,901	75,854	85,865	a634,580
Nov.	31,054	49,050	242,592	51,114	90,073	31,255	67,341	91,715	a604,271
Dec.	36,977	48,143	231,500	45,105	86,853	27,084	57,872	88,048	a595,246
1939									
Jan.	39,082	46,234	223,879	48,210	80,643	30,975	87,431	89,480	a598,342
Feb.	36,490	42,365	217,534	55,814	75,517	28,559	77,589	83,494	a582,653
Mar.	38,989	50,165	205,936	55,981	72,235	23,255	76,012	93,975	.....
Apr.	29,601	44,166	190,896	57,918	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. a Japan stocks not included.

RECLAIMED RUBBER

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption†	Consumption % to Crude	U. S. Stocks*	Exports
1937	185,033	162,000	29.8	28,800	13,233
1938	122,403	120,800	27.6	23,000	7,403
1939					
Jan.	14,826	13,743	29.7	23,334	748
Feb.	14,102	13,347	31.5	23,461	630
Mar.	15,647	16,197	32.3	22,155	756
Apr.	14,527	13,391	30.3	22,628	...

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage. *Compiled by The Rubber Manufacturers Association, Inc.*

ACCORDING to R. M. A. statistics, April reclaimed rubber consumption is estimated at 13,391 long tons, 12.6% below that of March; production at 14,527 long tons; and stocks on hand April 30, 22,628 long tons. It is expected that reclaim consumption during May will closely approximate that of April. Demand for reclaim originating from tire manufacturing sources has been good, particularly from those manufacturing replacement tires. Insulated wire manufacturers and producers of rubber soles and heels have not been buying reclaim in large amounts.

The market continues steady, and all grades of reclaim remain unchanged.

New York Quotations

May 22, 1939

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6 / 6¼
Acid	1.18-1.22	7 / 7¼
Shoe		
Standard	1.56-1.60	6½/ 6¾
Tubes		
No. 1 Floating	1.00	12 /12¼
Compound	1.10-1.20	8 / 8¼
Red Tube	1.15-1.30	8 / 8¼
Miscellaneous		
Mechanical Blends ...	1.25-1.50	4½/ 5
White	1.35-1.50	11½/12

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

CRUDE rubber consumption by United States manufacturers during April is estimated at 44,166 long tons, 12% under the 50,165 long tons for March, but 48.6% over the 29,730 (revised) long tons consumed in April, 1938, according to R.M.A. statistics.

Gross imports of crude rubber for April are reported to be 29,601 long tons, 24.1% under the March figure of 38,989 long tons and 3.9% under the 30,807 long tons of April, 1938.

Total domestic stocks of crude rubber on hand April 30 are estimated at 190,896 long tons, against March 31 stocks of 205,936 (revised) long tons and 303,901 (revised) long tons on hand April 30, 1938.

Crude rubber afloat to U. S. ports as of April 30 is set at 57,918 long tons, compared with 55,981 long tons afloat on March 31 and 39,071 long tons afloat on April 30, 1938.

RUBBER SCRAP

THE demand for scrap rubber ruled generally quiet during May. Export business, however, continued in good volume. The market is steady with all grades of scrap continuing unchanged at last month's levels.

CONSUMERS' BUYING PRICES

(Carload Lots for May 22, 1939)

		Prices
Boots and Shoes		
Boots and shoes, black	*lb.*	$0.01 /$0.01½
Colored	*lb.*	.00¾/ .00⅞
Untrimmed arctics	*lb.*	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	*lb.*	.08½/ .09
No. 2, compound	*lb.*	.03½/ .03¾
Red	*lb.*	.03½/ .03¾
Mixed tubes	*lb.*	.03½/ .03¾
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	*ton*	11.50 /12.00
Beadless	*ton*	15.00 /16.00
Auto tire carcass	*ton*	18.50 /19.50
Black auto peelings	*ton*	18.00 /19.00
Solid		
Clean mixed truck	*ton*	26.00 /27.00
Light gravity	*ton*	31.00 /33.00
Mechanicals		
Mixed black scrap	*ton*	15.00 /17.50
Hose, air brake	*ton*	20.00 /22.50
Garden, rubber covered	*ton*	10.00 /12.50
Steam and water, soft	*ton*	10.00 /12.50
No. 1 red	*lb.*	.02¾/ .03
No. 2 red	*lb.*	.02¼/ .02½
White druggists' sundries	*lb.*	.03¾/ .04
Mixed mechanicals	*lb.*	.02¼/ .02½
White mechanicals	*lb.*	.03⅝/ .03¾
Hard Rubber		
No. 1 hard rubber	*lb.*	.11 / .11½

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.†	Australia	Belgium	Canada	Czecho-Slovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1936	475,500	62,700	14,400	9,600	27,900	8,800	56,800	71,800	24,000	62,200	30,400	77,400	1,120,500
1937	592,500	137,300	19,300	15,000	36,100	13,000	60,000	98,200	28,170	46,307	25,649*	83,127	930,256
1938	406,330	169,201	12,309	11,310	25,696	9,936	58,144	90,200	16,000	61,700	31,000	65,100	831,800
1939													
Jan.	36,614	7,121	954	898	2,867	1,131	4,694	7,227	2,133	2,553	4,000*	7,152	71,037
Feb.	30,578	8,225	1,785	1,068	1,451	524	5,327	7,569	2,025	3,263	1,000*	6,901	66,431

*Estimated. †U. K. figures show gross imports, not net imports. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

COMPOUNDING INGREDIENTS

THE demand for compounding ingredients in general continued fairly active during May. With no appreciable curtailment in rubber manufacturing operations anticipated for the near future, activity should continue at a fair rate. Although some lines of rubber manufacture have slackened somewhat, tire business is reported to be holding up well. Prices in general continue substantially unchanged.

CARBON BLACK. Following a dull opening week, the domestic demand for carbon black was reported as showing noticeable gains in May, with most of the orders coming from small tire manufacturers. The export trade in black showed an unexpected increase in demand which continued through the month. The price remains firm and unchanged.

FACTICE OR RUBBER SUBSTITUTES. The demand for rubber substitutes is fair, with prices unchanged.

LITHARGE. This pigment continued active in demand during May. Prices remain unchanged, but firm.

LITHOPONE. Demand for lithopone has been holding fairly active, with increased business toward the latter part of the month. No price changes were made.

RUBBER CHEMICALS. Sales of rubber chemicals during May continued at about the same volume as in April. Prices remain generally unchanged.

RUBBER SOLVENTS. Demand has been fair although tire manufacturers have continued to buy in small-sized quantities. Prices are firm and unchanged.

STEARIC ACID. Business continued along conservative lines with demand only moderate. In company with basic material the acid is selling at previously quoted levels.

TITANIUM PIGMENTS. Orders for titanium pigments continued in good volume, and price schedules have not been revised.

ZINC OXIDE. The demand for zinc oxide was active during May, although the quantities taken by the rubber industry were somewhat disappointing. No price changes were reported.

New York Quotations

May 23, 1939

Prices Not Reported Will Be Supplied on Application

Abrasives			
Pumicestone, powdered	lb.	$0.03	/$0.035
Rottenstone, domestic	lb.	.03	/ .035
Silica, 15	ton	38.00	
Accelerators, Inorganic			
Lime, hydrated, l.c.l., New York	ton	20.00	
Litharge (commercial)	lb.	.0675/	.0725
Accelerators, Organic			
A-1	lb.	.24	
A-10	lb.	.35	/ .40
A-11	lb.	.52	/ .65
A-19	lb.	.52	/ .65
A-32	lb.	.70	/ .80
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
Accelerator 49	lb.	.42	
737	lb.	.42	/ .43
737-50	lb.	.25	/ .26
808	lb.	.70	/ .72
833	lb.	1.15	
Acrin	lb.	.60	
Aldehyde ammonia	lb.	.70	
Altax	lb.	.55	/ .70
B-J-F	lb.	.50	/ .55
Beutene	lb.	.70	/ .75
Butyl Zimate	lb.	2.50	
C-P-B	lb.	2.00	
Captax	lb.	.50	/ .60
Crylene	lb.	.40	/ .47
Paste	lb.	.30	/ .36
D-B-A	lb.	2.00	
Delac A	lb.	.40	/ .50
O	lb.	.40	/ .50
P	lb.	.40	/ .50
Di-Esterex	lb.	.60	/ .70
N	lb.	.60	/ .70
DOTG (Di-ortho-tolylguanidine)	lb.	.44	/ .46
DPG (Diphenylguanidine)	lb.	.35	/ .45
El-Sixty	lb.	.50	/ .65
Ethylideneaniline	lb.	.42	/ .43
Ethyl Zimate	lb.	2.50	
Formaldehyde P.A.C.	lb.	.0625	
Formaldehydeaniline	lb.	.31	
Formaldehyde-para-toluidine	lb.	.52	/ .54
Guantal	lb.	.40	/ .50
Hepteen	lb.	.35	/ .40
Base	lb.	1.35	/ 1.50
Hexamethylenetetramine U.S.P.	lb.	.39	
Technical	lb.	.33	
Lead oleate, No. 999	lb.	.13	
Witco	lb.	.15	
Monex	lb.	2.35	
Novex	lb.		
O. N. V.	lb.	1.00	/ 1.10
O-X-A-F	lb.	.50	/ .55
Ovac	lb.	.50	/ .55
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	1.00	/ 1.10
Pentex Flour	lb.	.15	/ .16
Pip-Pip	lb.	2.50	
Pipsolene	lb.	1.55	/ 1.85
R-2	lb.	1.40	/ 1.80
R-23	lb.	.40	
R & H 50-D	lb.	$0.42	/$0.43
Rotax	lb.	.60	/ .65
Safex	lb.	1.20	/ 1.30
Santocure	lb.	.80	/ 1.00
Super-sulphur No. 1	lb.	.50	
2	lb.	.18	/ .25
Tetrone A	lb.	2.70	
Thiocarbanilide	lb.	.24	/ .30
Thionex	lb.	2.35	
Trimene	lb.	.55	/ .65
Base	lb.	1.05	/ 1.20
Triphenylguanidine (TPG)	lb.	.45	
Tuads	lb.	2.35	
Ureka	lb.	.60	/ .75
Blend B	lb.	.60	/ .75
C	lb.	.56	/ .65
Vulcanex	lb.	.42	/ .43
Vulcanol	lb.	.85	
Z-B-X	lb.	2.50	
Z-88-P	lb.	.51	
Zenite	lb.	.46	/ .48
A	lb.	.53	/ .55
B	lb.	.46	/ .48
Zimate	lb.	2.35	
Activator			
Aero Ac 50	lb.		
Barak	lb.	.50	
Age Resisters			
AgeRite Alba	lb.	1.50	/ 2.00
Exel	lb.	1.00	/ 1.40
Gel	lb.	.57	/ .75
Hipar	lb.	.65	/ .92
Powder	lb.	.52	/ .65
Resin	lb.	.52	/ .65
D	lb.	.52	/ .65
White	lb.	1.25	/ 1.65
Akroflex C	lb.	.56	/ .58
Albasan	lb.	.70	/ .75
Aminox	lb.	.52	/ .61
Antox	lb.	.56	
B-L-E	lb.	.52	/ .61
Powder	lb.	.65	/ .74
B-X-A	lb.	.55	/ .61
Copper Inhibitor X-872	lb.	1.15	
Flectol B	lb.	.52	/ .65
H	lb.	.52	/ .65
White	lb.	.90	/ 1.15
M-U-F	lb.	1.50	
Neozone (standard)	lb.	.63	
A	lb.	.52	/ .54
B	lb.	.63	
C	lb.	.52	/ .54
D	lb.	.52	/ .54
E	lb.	.63	
Oxynone	lb.	.64	/ .80
Parazone	lb.	.68	
Permalux	lb.	1.20	
Santoflex B	lb.	.52	/ .65
Solux	lb.	1.30	
Thermoflex A	lb.	.65	/ .67
V-G-B	lb.	.52	/ .61
Alkalies			
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	2.70	/ 3.55
liquid, 50%	100 lbs.	1.95	
solid (700 lb. drums)	100 lbs.	2.30	/ 3.15
Antiscorch Materials			
A-F-B	lb.	$0.35	/$0.40
Antiscorch T	lb.	.90	
E-S-E-N	lb.	.35	/ .40
R-17 Resin (drums)	lb.	.10	
RM	lb.	1.25	
Retarder W	lb.	.36	
U.T.B.	lb.	.35	/ .40
Antisun Materials			
Heliozone	lb.	.21	
Sunproof	lb.	.20	/ .25
Colors			
BLACK			
Du Pont powder	lb.	.42	/ .44
Lampblack (commercial)	lb.	.15	
BLUE			
Brilliant	lb.		
Du Pont dispersed	lb.	.83	/ 3.60
Powders	lb.	2.25	/ 3.75
Prussian	lb.	.0375	
Toners	lb.	.08	/ 3.85
BROWN			
Mapico	lb.	.11	
GREEN			
Brilliant	lb.		
Chrome, light	lb.		
medium	lb.	.22	
oxide (freight allowed)	lb.		
Dark	lb.		
Du Pont dispersed	lb.	.98	/ 1.75
Powders	lb.	1.00	/ 2.00
Guignet's, Easton, Pa., bbls.	lb.	.70	
Light	lb.		
Toners	lb.	.85	/ 3.75
ORANGE			
Du Pont dispersed	lb.	.88	/ .90
Powders	lb.	.80	/ 2.50
Lake	lb.		
Toners	lb.	.40	/ 1.60
ORCHID			
Toners	lb.	1.50	/ 2.00
PINK			
Toners	lb.	1.50	/ 2.00
PURPLE			
Permanent	lb.		
Toners	lb.	.60	/ 2.10
RED			
Antimony Crimson, 15/17%	lb.	.45	
R. M. P. No. 3	lb.	.48	
Sulphur free	lb.	.50	
R.M.P.	lb.	.52	
Golden 15/17%	lb.	.28	
7-A	lb.	.37	
Z-2	lb.	.23	
Aristi	lb.	1.75	
Cadmium, light (400 lb. bbls.)	lb.	.70	/ .75
Chinese	lb.		
Crimson	lb.		
Du Pont dispersed	lb.	.93	/ 2.05
Powders	lb.	.52	/ 1.05
Mapico	lb.	.0925	
Medium	lb.		
Rub-Er-Red, Easton, Pa., bbls.	lb.	.0925	
Scarlet	lb.		
Toners	lb.	.08	/ 2.00

WHITE

Lithopone (bags)	lb.	$0.04½ / $0.04¾
Albalith Black Label-11	lb.	.04½ / .04¾
Astrolith	lb.	.04½ / .04¾
Azolith	lb.	.04½ / .04¾
Cryptone-BA-19	lb.	.05⅝ / .05⅞
BT	lb.	.05⅝ / .05⅞
CB	lb.	.05¾ / .05⅞
ZS No. 20	lb.	.07¾ / .08½
86	lb.	.07¾ / .08½
230	lb.	.07¾ / .08½
Sunolith	lb.	.04½ / .04¾
Ray-Bar	lb.	.05¾ / .06⅜
Ray-Cal	lb.	.05¾ / .06⅜
Rayox	lb.	.14 / .17
Titanolith (5-ton lots)	lb.	.05¾ / .05⅞
Titanox-A (50-lb. bags)	lb.	.14 / .14¾
B (50-lb. bags)	lb.	.05¾ / .05⅞
30 (50-lb. bags)	lb.	.05¾ / .05⅞
C (50-lb. bags)	lb.	.05¾ / .05⅞
M	lb.	.05¾ / .05⅞
Ti-Tone	lb.	
Zinc Oxide		
Azo ZZZ-11	lb.	.0625/ .065
44	lb.	.0625/ .065
55	lb.	.0625/ .065
66	lb.	.0625/ .065
French Process, Florence		
White Seal-7 (bbls.)	lb.	.085 / .0875
Green Seal-8	lb.	.08 / .0825
Red Seal-9	lb.	.075 / .0775
Kadox, Black Label-15	lb.	.065 / .0675
No. 25	lb.	.075 / .0775
Red Label-17	lb.	.065 / .0675
Horse Head Special 3	lb.	.0625/ .065
XX Red-4	lb.	.0625/ .065
23	lb.	.0625/ .065
72	lb.	.0625/ .065
78	lb.	.0625/ .065
80	lb.	.0625/ .065
103	lb.	.0625/ .065
110	lb.	.0625/ .065
St. Joe (lead free)		
Black Label	lb.	.0625/ .065
Green Label	lb.	.0625/ .065
Red Label	lb.	.0625/ .065
U.S.P.	lb.	.095 / .0975
White Jack	lb.	.07⅞ / .08⅛
Zopaque	lb.	.14 / .1475

YELLOW

Cadmolith (cadmium yellow), 400 lb. bbls.	lb.	.45 / .50
Du Pont dispersed	lb.	1.25 / 1.75
Powders	lb.	1.55 / 1.37
Lemon	lb.	
Mapico	lb.	.0675
Toners	lb.	2.50

Dispersing Agents

Darvan	lb.	.30 / .47
Nevoll (drums)	lb.	.0215
Santomerse S	lb.	.11 / .25

Fillers, Inert

Asbestine, c.l., f.o.b., mills	ton	15.00
Barytes	ton	30.00 /36.00
f.o.b., St. Louis (50 lb. paper bags)	ton	22.85
off color, domestic	ton	20.00 /25.00
white, imported	ton	29.00 /32.00
Blanc fixe, dry, precip.	lb.	.03 / .035
Calcene	ton	37.50 /43.00
Infusorial earth	lb.	.02 / .03
Kalite No. 1	ton	24.00 /50.00
3	ton	34.00 /60.00
Magnesia, calcined, heavy	lb.	.04
Carbonate, l.c.l.	lb.	.07 / .095
Pyrax A	ton	6.50 /20.00
Whiting		
Columbia Filler	ton	9.00 /14.00
Guilders	100 lbs.	
Hakuenka	lb.	
Paris white, English cliff. stone	100 lbs.	
Southwark Brand, Commercial	100 lbs.	
All other grades	100 lbs.	
Suprex, white extra light.	ton	45.00 /60.00
heavy	ton	45.00 / 60.00
Witco, c.l.	ton	6.00

Finishes

Rubber lacquer, clear	gal.	
colored	gal.	
Starch, corn, pwd.	100 lbs.	
potato	lb.	
Talc	ton	25.00 /45.00

Flock

Cotton flock, dark	lb.	.10 / .12
dyed	lb.	.40 / .80
white	lb.	.11 / .18
Rayon flock, colored	lb.	1.00 / 2.00
white	lb.	.90

Latex Compounding Ingredients

Accelerator 85	lb.	.35
89	lb.	1.40
122	lb.	1.55
552	lb.	2.50
Aerosol	lb.	.45
Antox, Dispersed	lb.	.42
Aquarex A	lb.	.35
D	lb.	.75
F	lb.	.85
WA Paste	lb.	.25
Areskap No. 50	lb.	$0.18 /$0.24
100, dry	lb.	.39 / .51
Aresket No. 240	lb.	.16 / .22
300, dry	lb.	.42 / .50
Aresklene No. 375	lb.	.35 / .50
400, dry	lb.	.51 / .65
Black No. 25, Dispersed	lb.	.22 / .40
Catalpo	ton	
Collocarb	lb.	.055 / .07
Color Pastes, Dispersed	lb.	.35 / 1.90
Dispersex No. 15	lb.	.11 / .12
No. 20	lb.	.08 / .10
Emo, brown	lb.	.15
white	lb.	.15
Factice Compound, Dispersed	lb.	.36
Heliozone, Dispersed	lb.	.25
Igepon A	lb.	
MICRONEX, Colloidal	lb.	.055 / .07
Nekal BX (dry)	lb.	
Palmol	lb.	.11
Pipsol X	lb.	3.05 / 3.55
R-23	lb.	.40
RN-2	lb.	1.40 / 1.80
S.1 (400 lb. drums)	lb.	.65
Santomerse D	lb.	.41 / .65
S	lb.	.11 / .25
No. 1	lb.	.18 / .35
No. 2	lb.	.18 / .35
No. 3	lb.	.40 / .65
No. 3P	lb.	.29 / .45
Santovar A	lb.	1.15 / 1.40
Stablex A	lb.	.90 / 1.10
B	lb.	.65 / .90
C	lb.	.40 / .50
Sulphur, Dispersed	lb.	.10 / .15
No. 2	lb.	.075 / .15
T.1. (400 lb. drums)	lb.	.40
Tepidone	lb.	1.45
Vulcan Colors	lb.	
Zinc oxide, Dispersed	lb.	.12 / .15

Mineral Rubber

Black Diamond	ton	25.00
Hydrocarbon, hard	ton	22.00 /42.00
Parmr	ton	22.00 /24.00
Pioneer	ton	
285°-300°	ton	22.00 /42.00

Mold Lubricants

Mold Paste	lb.	.12 / .18
Sericite	ton	65.00 /75.00
Soapbark	lb.	
Soapstone	ton	25.00 /35.00

Oil Resistant

AXF	lb.	.40 / .50

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	lb.	.0275/ .0625
Arrow Compact Granulized Carbon Black	lb.	.0275/ .0625
"Certified" Heavy Compressed, Cabot	lb.	
Spheron	lb.	
Carbitum	ton	58.00 /63.00
Continental Dustless, c.l.	lb.	.0275/ .0375
Compressed c.l.	lb.	.0275/ .0375
Uncompressed, c.l.	lb.	.0275/ .0375
Disperso, c.l.	lb.	.0275/ .0375
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Dixiedensed, c.l., f.o.b., New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Dixiedensed, 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Excello, c.l., f.o.b Gulf ports	100 lbs.	2.75 / 4.75
delivered New York	100 lbs.	3.75 / 5.75
l.c.l., delivered New York	100 lbs.	6.25 / 7.00
Fumonex, c.l., f.o.b. works	lb.	.03
ex-warehouse	lb.	.05
Gastex	lb.	.03 / .07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Kosmobile 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0275
c.l., delivered New York	lb.	$0.0375
local stock, bags, delivered	lb.	.0625
MICRONEX Beads, c.l., f.o.b. Gulf ports	lb.	.0275
c.l., delivered, New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Mark II, c.l., f.o.b. Gulf ports	lb.	.0275
c.l., delivered, New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Standard, c.l., f.o.b. Gulf ports	lb.	.0275
c.l., delivered, New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
W-5, c.l., f.o.b., Gulf ports	lb.	.0275
c.l., delivered, New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
W-6, c.l., f.o.b., Gulf ports	lb.	.0275
c.l., delivered, New York	lb.	.0375
local stock, bags, delivered	lb.	.0625
Paradene No. 2 (drums)	lb.	.04
Pelletex	lb.	.03 /$0.07
Supreme, c.l., f.o.b. Gulf ports	100 lbs.	2.75 / 4.75
delivered New York	100 lbs.	3.75 / 5.75
l.c.l., delivered New York	100 lbs.	6.25 / 7.00
"WYEX BLACK"	lb.	.0275/ .0625

Clays

Aerfloted Paragon (50 lb. bags)	ton	9.50 /22.00
Suprex (50 lb. bags)	ton	9.50 /22.00
China	ton	17.50 /20.00
Crown, f.o.b. (plant)	ton	9.50
Dixie	ton	11.00 /26.00
Junior	ton	9.50 /24.00
Hi-White, f.o.b. Huber Ga.	ton	9.50
McNamee	ton	9.50 /22.00
Par	ton	9.50 /22.00
Witco, f.o.b. works	ton	9.50
P-33	lb.	.0475/ .0775
Thermax	lb.	.0175/ .05
Velvetex	lb.	.022 / .035

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Curodex 19	lb.	2.75
188	lb.	3.50
198	lb.	4.50
Rodo No. 0	lb.	3.50 / 4.00
10	lb.	4.50 / 5.00

Rubber Substitutes

Black	lb.	.07 / .11
Brown	lb.	.07 / .10
White	lb.	.08 / .11½
Factice		
Amberex	lb.	.19
Brown	lb.	.07 / .10
Fac-Cel B	lb.	.12
C	lb.	.12
Neophax A	lb.	.0975
B	lb.	.0975
White	lb.	.08 / .11

Softeners

Bondogen	lb.	.98 / 1.50
Burgundy pitch	lb.	.06
Cycline oil	gal.	.14 / .20
Nuba resinous pitch (drums) Grades No. 1 and No. 2	lb.	.0265
Nubalene Resin	lb.	.025
Palm oil (Witco), c.l.	lb.	.0575
Pine tar	gal.	
Plastogen	lb.	.0775/ .12
R-19 Resin (drums)	lb.	.10
R-21 Resin (drums)	lb.	.10
Reogen	lb.	.115 / .26
Rosin oil, compounded	gal.	.40
RPA No. 1	lb	.65
2	lb.	.65
3	lb.	.46
Rubtack	lb.	.10
Tackol	lb.	.085 / .18
Tonox	lb.	.52 / .61
Tonox D	lb.	.75 / .85
Witco No. 20	gal.	.20
X-1 Resinous oil (tank car)	lb.	.019

Solvents

Beta-Trichlorethane	gal.	
Carbon bisulphide	lb.	
tetrachloride	lb.	
Industrial 90% benzol (tank car)	gal.	.16
Skellysolve	gal.	

(Continued on page 80)

As Distinctive

as Harris Tweed

as Russian Leather

a Meerschaum Pipe

is the Performance of the

Robertson Cable

Lead Encasing Press . . .

the Robertson Hydro-

Pneumatic Accumulator

. . . the Robertson

Hydraulic Pump. FOR DETAILS

WRITE

JOHN ROBERTSON CO., INC., 131 WATER ST., BROOKLYN, N. Y.

Regular and Special Constructions of

COTTON FABRICS

Single Filling Double Filling and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

COTTON AND FABRICS

THE accompanying table of week-end closing prices on the New York Cotton Exchange shows the week-end change of representative futures covering the past two months.

The New York spot middling price closed at 9.12¢ per pound on May 1. The price rose steadily during the first four weeks to close at 9.82¢ on May 26, the high for the year. Then the price declined slightly, closing at 9.77¢ on May 27.

Sales at 13 southern markets totaled 104,203 bales during 16 days since May 1, against 42,900 bales for the same days one year ago.

Consumption of all cotton in domestic mills during April totaled 546,702 bales, against 649,237 in March and 413,169 in April, 1938, according to the Census Bureau. Exports of cotton from the United States during April totaled 178,000 bales, value $8,973,000, against 330,000, value $16,749,000, during March, and 377,000, value $19,634,000, during April, 1938, according to the Bureau of Foreign and Domestic Commerce.

It was reported that the barter proposal with Great Britain involving an exchange of American cotton for British rubber was nearing an agreement. Announcement of the agreement is expected in the early part of June.

New York Cotton Exchange Week-End Closing Prices

Futures	Mar. 25	Apr. 29	May 6	May 13	May 20
Apr.	8.17	....	....	....	....
May	....	8.38	8.67	9.04	....
June	....	8.25	8.51	8.77	9.06
July	7.93	8.12	8.36	8.51	8.76
Sept.	7.58	7.79	7.94	8.04	8.01
Dec.	7.52	7.58	7.72	7.75	7.71
Mar.	....	7.56	7.72	7.69	7.63
Apr.	....	....	....	....	7.62

New York Quotations

May 25, 1939

Drills		
38-inch 2.00-yard	yd.	$0.10
40-inch 3.47-yard		.06⅜
50-inch 1.52-yard		.14⅞
52-inch 1.85-yard		.12⅜
52-inch 1.90-yard		.11¾
52-inch 2.20-yard		.10¼
52-inch 2.50-yard		.09
39-inch 1.85-yard		.11½
Ducks		
38-inch 2.00-yard D.F.	yd.	.10 /.10½
40-inch 1.45-yard S. F.		.14⅞
51½-inch 1.35-yard D. F.		.14⅞
72-inch 1.05-yard D. F.		.20½/.21
72-inch 17.21-ounce		.23⅞
Mechanicals		
Hose and belting	lb.	.24½
Tennis		
52-inch 1.35-yard	yd.	.16⅛
Hollands		
Gold Seal and Eagle		
20-inch No. 72	yd.	.09
30-inch No. 72		.16
40-inch No. 72		.18
Red Seal and Cardinal		
20-inch	yd.	.07½
30-inch		.13¼
40-inch		.15
50-inch		.24
Osnaburgs		
40-inch 2.34-yard	yd.	.09
40-inch 2.48-yard		.08⅝
40-inch 2.56-yard		.07¼
40-inch 3.00-yard		.07⅛
40-inch 7-ounce part waste		.07
40-inch 10-ounce part waste		.10
37-inch 2.42-yard		.08⅞
Raincoat Fabrics		
Cotton		
Bombazine 60 x 64	yd.	.07
Plaids 60 x 48		.09¾
Surface prints 60 x 64		.11
Print cloth, 38½-inch, 60 x 64		.04¼
Sheetings, 40-Inch		
48 x 48, 2.50-yard	yd.	.06⅜
64 x 68, 3.15-yard		.06½
56 x 60, 3.60-yard		.05½
44 x 40, 4.25-yard		.04⅜
Sheetings, 86-Inch		
48 x 48, 5.00-yard	yd.	.04
44 x 40, 6.15-yard		.03¼
Tire Fabrics		
Builder		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.27½
Chafer		
14 ounce 60" 20/8 ply Karded peeler	lb.	.27½
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.26½
Cord Fabrics		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.28
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.26
23/5/3 Karded peeler, 1¼" cotton	lb.	.33½
23/5/3 Combed Egyptian	lb.	.47
Lino Breaker		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.29½

New York Quotations

May 25, 1939

Fabrics

Following a dull period in April, the market for cotton textiles of coarse yarn construction became more active, and during May a somewhat higher volume of business was accomplished. Some stimulus has been added by the sharp advance in the price of raw cotton and reports of reduced fabric inventories. Because of cold weather, raincoats dropped in sales during the early part of May, but renewed activity was reported at mid-month.

The market closed irregular, with some types of drills, ducks, and osnaburgs showing fractional gains and other types remaining steady or advancing slightly in price. Sheetings were mainly steady; while prices of raincoat fabrics advanced slightly. Hollands were unchanged, and all types of tire fabrics advanced ½¢ per pound.

Canada Taxes Rubber Entering through U. S.

Recently announced Canadian tariff changes state that crude rubber, formerly free of duty from all countries, is now subject to an ad valorem duty of 5% when not imported direct from Empire countries. This duty is assessed to assure that crude rubber from Empire sources will continue to be imported through Canadian ports.

In accordance with the revised United States-Canada trade agreement, provisionally effective on and after April 26, 1939, the Canadian Government has eliminated the 3% special excise tax on all imports from the United States and other commercial-agreement countries except those imports subject to entry under the general tariff.

EASTERN

(*Continued from page 60*)

Mr. Bridgwater's address on Neoprene were part of a discussion of methods of research management by which industrial research may be made profitable to corporations that engage in it and beneficial to our whole economy.

Quaker City Rubber Co., manufacturer of mechanical rubber goods, Comly and Milnor Sts., Philadelphia, Pa., on May 1 promoted the following: R. S. Wharton, former general sales manager, to vice president in charge of sales, replacing F. C. Millhoff, retired; G. C. Johnson, former manager of Chicago branch, to general sales manager; H. C. Heine, to manager, Chicago branch, with E. Asbridge as his assistant.

NEW ENGLAND

(*Continued from page 63*)

retain active supervision of factory sales. This corporation operates four plants at Chelsea and Stoughton, both in Mass., Trenton, N. J., and Sherbrooke, Canada. The Trenton factory, engaged solely in the production of resilient floor coverings, makes a complete line of rubber tile and sheet rubber flooring and wall covering, mats, table tops, etc. The greatest increases the past year were, according to company officials, in the stable, branded lines as Biltrite and PANcord-on-end soles and heels, Sta-tite heels, and Panco soles and heels, but with a marked increase in demand for crepe soles for various types of sports and recreation shoes. With both production and promotional plans stepped up in 1939, an even more successful year is anticipated by the Panther-Panco organization during the next twelve months.

A. G. Spalding & Bros., Chicopee, Mass., has announced the election at its last directors' meeting of Walter B. Gerould, formerly vice president in charge of accounts, as secretary and treasurer, succeeding C. S. Lincoln, whose request for retirement, after many years of service, was accepted with regret. E. E. Combs, formerly assistant treasurer, also resigned.

United States Latex Imports

Year	Pounds (d.r.c.)	Value
1937	51,934,040	$10,213,670
1938	**26,606,048**	**4,147,318**
1939		
Jan.	3,589,452	$99,927
Feb.	3,844,996	657,565
Mar.	4,491,951	731,302

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

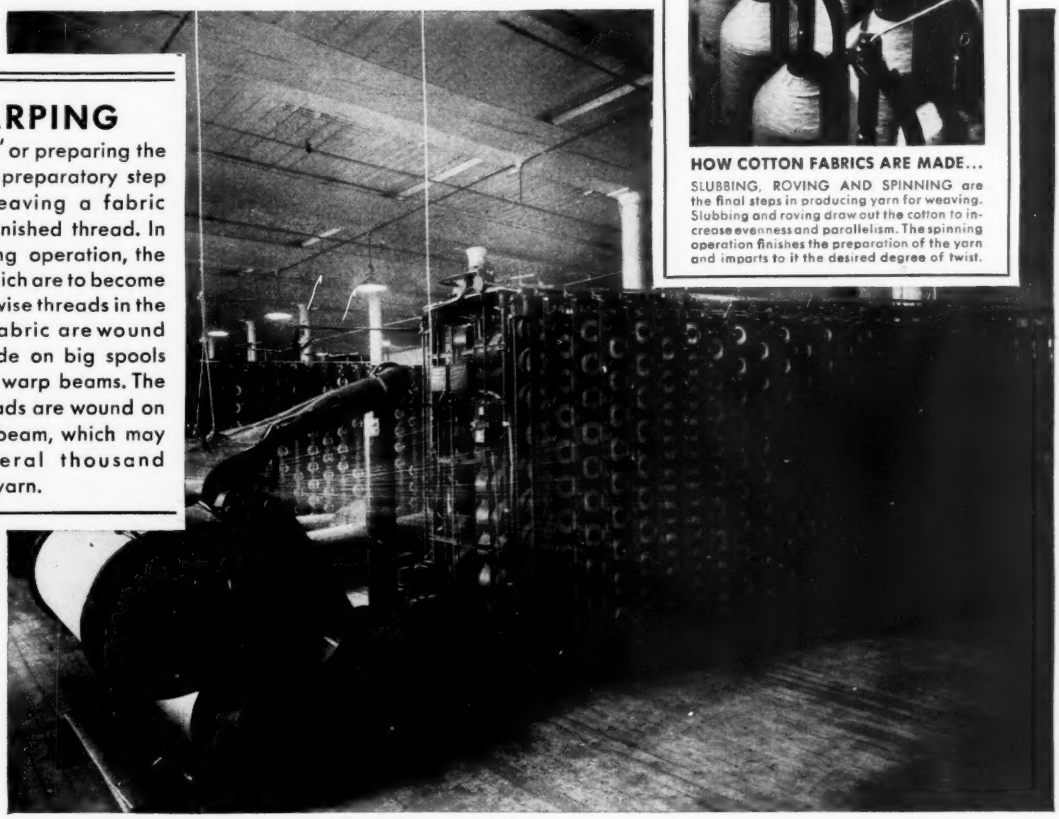
HOW COTTON FABRICS ARE MADE...

HOW COTTON FABRICS ARE MADE...

SLUBBING, ROVING AND SPINNING are the final steps in producing yarn for weaving. Slubbing and roving draw out the cotton to increase evenness and parallelism. The spinning operation finishes the preparation of the yarn and imparts to it the desired degree of twist.

WARPING

"Warping" or preparing the warp is a preparatory step before weaving a fabric from the finished thread. In the warping operation, the threads which are to become the lengthwise threads in the finished fabric are wound side by side on big spools called the warp beams. The warp threads are wound on a section beam, which may hold several thousand yards of yarn.



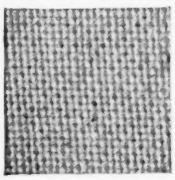
THE WARP IS THE FABRIC'S BACKBONE

Much depends upon proper construction of the warp, particularly in fabrics for the Rubber Industry. Our skilled textile engineers have a thorough knowledge of the possibilities for varying the performance of a fabric through alteration in the warp construction. This experience can help you solve your rubber fabric problems as it has helped others. We'll be only too glad to discuss our services with you.

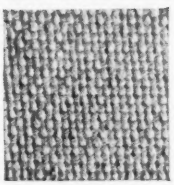
WELLINGTON SEARS COMPANY

65 WORTH STREET, NEW YORK, N. Y.

Shawmut Chafer Fabric

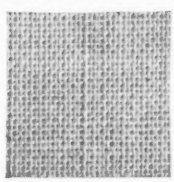


Shawmut Hose Duck



Columbus Sheeting

West Point Osnaburg



Shawmut Belting Duck

Book Reviews

(Continued from page 67)

commodity problems of a general nature. Fifty individual commodities are covered, being grouped as follows: grains; textiles; tropical products; industrial products (other than textiles); fats, oils, and oilseeds; livestock, dairy products, and potatoes; and metals. The book presents 120 chart illustrations in addition to the many tables, while relevant text material accompanies each set of statistics.

Thus, the section on rubber contains brief information on the history, uses, and sources of rubber and a discussion of international production control. A 1938 chronology of important events affectjng the rubber market is also presented. Rubber statistics, in the form of charts and tables, include data on prices, exports, stocks, absorption, and basic quotas of agreement countries. Supplementary tables cover United States statistics on reclaimed rubber and production, shipments, and stocks of casings and tubes.

"The Economics of Chemical Industries." Edward H. Hempel. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y. 1939. Cloth, 6 by 9 inches, 259 pages. Index. Price $3.

The purpose of this book is to familiarize readers with the economics common to the American chemical industries. Avoiding a strictly theoretical treatment, the basic rules and methods have been so presented that they can be easily put to actual use. The industries dealt with are much the same as those classified by the U. S. Bureau of the Census as belonging in the chemical group. Subjects covered include: history, patents, requirements for production, forecasting demand, sales, prices, financial policies, and foreign trade. The book contains a number of tables and concludes with an appendix, a bibliography, and an index.

"Casein and Its Industrial Applications." Second Edition. E. Sutermeister and F. L. Browne. Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. 1939. Cloth, 6 by 9 inches, 433 pages. Subject and author indexes. Price $6.50.

Since the appearance of the first edition of this American Chemical Society Monograph in 1927, conspicuous progress has been made in the chemistry, production, and utilization of casein. Thus, while the general plan and scope of the book remain unaltered in this second edition, nearly all the chapters have been revised or rewritten. The book covers the chemistry, manufacture, storage, and testing of casein and its application in the plastics, glue, paper, paint, and leather industries. Included are a number of brief references to the use of casein with rubber, rubber derivatives, and latex. These references cover a broad field—adhesives; paints and varnishes; molding compositions; and flexible coatings for paper, textiles, and leather.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalgar Sq., London, W.C.2, England, gives the following figures for April, 1939:

Rubber Gross Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham.

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	7,675	470
United States	18,031	985
Continent of Europe	7,350	333
British possessions	4,899	24
Japan	2,402	20
Other countries	1,470	9
Totals	41,827	1,841

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	5,350	103
Dutch Borneo	2,046	..
Java and other Dutch islands	297	..
Sarawak	2,369	..
British Borneo	584	60
Burma	113	2
Siam	2,120	531
French Indo-China	227	107
Other countries	84	3
Totals	13,190	806

Rubber and Canvas Footwear Production Statistics

	Thousands of Pairs		
	Inventory	Production	Shipments
1937	20,430	74,102	67,191
1938	16,183	50,812	54,942
1939			
Jan.	16,157	4,807	4,778
Feb.	16,582	4,953	4,629
Mar.	17,281	5,897	5,214

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

New York Quotations

(Continued from page 76)

Stabilizers for Cure		
Laurex, ton lots	lb.	$.105 / $.13
Stearex B	lb.	.10 / .11
Beads	lb.	.09 / .10
Stearic acid, single pressed	lb.	.10 / .11
Stearite	100 lbs.	.09
Zinc stearate	lb.	.23
Synthetic Rubber		
Neoprene Type E	lb.	.65
G	lb.	.70
GW	lb.	.75
H	lb.	.78
M	lb.	.65
Latex Type 57	lb.	.30
Varnish		
Shoe	gal.	1.45
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.035 / .04
Rubber	100 lbs.	2.65
Telloy	lb.	1.75
Vandex	lb.	1.75
(See also Colors—Antimony)		
Waxes		
Carnauba, No. 3 chalky	lb.	.37½
2 N.C.	lb.	.39½
3 N.C.	lb.	.37½
1 Yellow	lb.	.4575
2	lb.	.4425
Montan, crude	lb.	.11

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Philippines Total	Philippines and Oceania	Liberia†	Other Africa	South America	Mexican Guayule	Grand Total
1936	353,700	309,600	49,700	8,600	5,800	8,200	21,000	34,600	40,800	832,000	1,600*	1,600	6,800	14,600	1,300	857,900
1937	469,900	431,700	70,400	9,800	7,200	13,200	25,900	35,600	43,400	1,107,100	1,600*	2,300	9,100	16,300	3,400	1,139,800
1938	372,046	298,112	49,528	8,451	6,737	9,512	17,792	41,618	58,518	862,314	1,971*	2,929	9,000*	15,337	2,758	894,309
1938																
Jan.	30,998	26,468	5,222	841	538	1,307	3,485	2,897	6,088	77,844	138	501	750*	938	117	80,288
Feb.	37,166	27,327	5,216	639	770	918	8	3,266	3,070	78,380	125	168	750*	1,640	96	81,159
Mar.	33,567	31,270	3,834	532	703	853	1,564	2,837	3,213	78,373	159	108	750*	1,883	696	81,969
Apr.	44,744	28,489	1,951	485	842	1,158	1,728	1,583	3,647	84,627	201	308	750*	1,085	203	87,174
May	28,011	22,039	2,833	909	561	815	1,648	2,507	3,118	62,441	120	175	750*	1,160	446	65,092
June	28,048	24,427	3,693	625	693	643	2,441	3,904	4,776	69,250	198	110	750*	809	...	71,117
July	25,035	35,142	3,861	601	482	937	2 057	4,710	5,139	77,984	126	311	750*	722	227	80,120
Aug.	33,618	23,057	4,401	647	306	728	965	4,793	3,840	72,355	204	125	750*	1,118	620	75,172
Sept.	30,485	20,207	3,990	824	212	284	756	3,803	8,139	68,790	208	445	750*	828	130	71,151
Oct.	25,788	29,883	4,893	832	279	1,075	1,612	4,976	3,638	72,976	128	222	750*	1,650	128	75,854
Nov.	29,214	19,195	6,422	670	601	567	929	3,223	4,035	64,856	164	274	750*	1,229	68	67,341
Dec.	25,352	10,608	3,212	846	750	227	599	3,029	9,815	54,438	200	182	750*	2,275	27	57,872
1939																
Jan.	24,393	38,678	7,237	764	1,115	1,604	2.342	2.918	4.739	83,790	220	528	800	1,812	281†	87,431
Feb.	29,278	24,996	5,495	947	618	664	1,484	5,606	5,659	74,747	158	435	800	1,187	262†	77,589
Mar.	29,298	27,881	3,641	787	619	344	1,177	5,401	3,907	73,055	200*	300*	800	1,407	250*	76,012

*Estimated. †Guayule rubber imports into U.S.A. and Germany provisional until export figures from Mexico are received. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

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Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
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RUBBER CHEMIST DESIRES POSITION AS COMPOUNDER AND development engineer. Twelve years' experience in mechanicals, tires, hard rubber, synthetic rubber, plumbing supplies, testing, developing testing apparatus, fabrics, yarns, raw materials. University trained. Married, 29 years of age. Will go anywhere. Willing to start at $35.00 per week. Address Box No. 1099, care of INDIA RUBBER WORLD.

PRODUCTION MANAGER, AGE 30, 5 YEARS' EXPERIENCE COMpounding and dipping of latex. Salary open. Address Box No. 1100, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, 29, EMPLOYED, DESIRES POSITION AS assistant to Technical Superintendent. Experienced compounding hose, extruded and molded goods. College graduate. $175.00. Address Box No. 1, care of INDIA RUBBER WORLD.

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$2,500 SALARIED POSITION $15,000

OUR SYSTEM OF SEARCHING OUT SALARIED POSITIONS, hiding your identity, increases your salary commensurate with training and experience. For valuable information write Rubber Department, EXECUTIVE'S PROMOTION SERVICE, Washington, D. C.

PROOFING PLANT SUPERINTENDENT FAMILIAR WITH PRODucing general line of coated fabrics. Plant located within reasonable distance of New York. Give complete details regarding experience. Address Box No. 1093, care of INDIA RUBBER WORLD.

WANTED: SALES EXECUTIVE. EXCELLENT OPPORTUNITY for experienced mechanical rubber goods Sales Executive between ages of thirty and forty to be Assistant Sales Manager of small progressive mechanical rubber goods company. Straight salary commensurate with experience, possibilities of new accounts and further development of present accounts. Address Box No. 1095, care of INDIA RUBBER WORLD.

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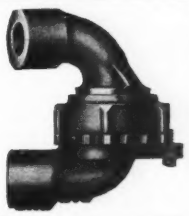

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745 Fifth Avenue **New York**

AN APPROVED CLAY
CROWN CLAY
SOUTHEASTERN CLAY COMPANY
AIKEN, SOUTH CAROLINA

(Advertisements continued on page 83)

Rubber Questionnaire

Fourth Quarter, 1938*

	Long Tons			
	Inventory at End of Quarter	Production	Shipments	Consumption
RECLAIMED RUBBER				
Reclaimers solely (5)	4,198	18,993	19,165	.....
Manufacturers who also reclaim (16)	5,338	12,872	2,612	11,913
Other manufacturers (96)	4,956	.....	.....	13,685
Totals	14,492	31,865	21,777	25,598

	Long Tons		
	Inventory	Consumption	Due on Contracts
SCRAP RUBBER			
Reclaimers solely (5)	45,931	21,582	9,432
Manufacturers who also reclaim (15)	37,741	14,666	4,418
Other manufacturers (13)	574	....	....
Totals	84,246	36,248	13,850

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

	Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
PRODUCTS		
Tire and Tire Sundries		
All types pneumatic casings (except bicycle, airplane)	67,000	$73,058,000
All types pneumatic tubes (except bicycle, airplane)	9,659	9,489,000
Bicycle tires, including juvenile pneumatics (single tubes, casings, and tubes)	734	945,000
Airplane tires and tubes	52	185,000
Solid and cushion tires for highway transportation	61	105,000
All other solid and cushion tires	62	225,000
Tire sundries and repair materials	2,254	3,095,000
Totals	79,822	$87,102,000
OTHER RUBBER PRODUCTS		
Mechanical rubber goods	9,479	$28,876,000
Boots and shoes	3,996	13,515,000
Insulated wire and cable compounds	1,429	†
Druggists' sundries, medical and surgical rubber goods	889	2,304,000
Stationers' rubber goods	478	541,000
Bathing apparel	187	43,000
Miscellaneous rubber sundries	736	1,366,000
Rubber clothing	151	824,000
Automobile fabrics	83	440,000
Other rubberized fabrics	917	2,290,000
Hard rubber goods	503	2,179,000
Heels and soles	2,806	4,409,000
Rubber flooring	227	405,000
Sponge rubber	1,072	1,292,000
Sporting goods, toys, and novelties	416	1,100,000
Totals	23,369	$59,584,000
Grand totals—all products	103,191	$146,686,000

Inventory of Rubber in the United States and Afloat

	Long Tons	
	Crude Rubber on Hand	Crude Rubber Afloat
Manufacturers	90,072	5,952
Importers and dealers	93,945	36,784
Totals	184,017	42,736

* Number of rubber manufacturers that reported data was 169; crude rubber importers and dealers, 48; reclaimers (solely), 5; total daily average number of employes (reporting manufacturers and reclaimers), 126,158.

It is estimated that the reported grand total crude rubber consumption is 78.3%; grand total sales value, 80%; the grand total crude rubber inventory, 75%; afloat figures, unavailable; the reclaimed rubber production, 75.4% reclaimed consumption, 69.7%; and reclaimed inventory, 66.6% of the total of the entire industry.

† Owing to the difficulty of securing representative sales figures this item has been discontinued.

Compiled from R.M.A. statistics.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	December, 1938		Nine Months Ended December, 1938	
UNMANUFACTURED	Quantity	Value	Quantity	Value
Crude rubber, etc. *lb.*	4,924,258	$735,130	47,420,985	$6,682,569
Gutta percha *lb.*	281	37	12,090	6,535
Rubber, recovered *lb.*	1,082,900	52,695	7,219,200	373,971
Rubber, powdered, and gutta percha scrap *lb.*	476,300	9,184	4,061,100	59,402
Balata *lb.*	150	174	19,522	4,019
Rubber substitute *lb.*	16,900	3,937	257,700	50,206
Totals	6,500,789	$801,157	58,990,597	$7,176,702
PARTLY MANUFACTURED				
Hard rubber comb blanks	.....	$850	.....	$7,176
Hard rubber, n. o. s. *lb.*	2,716	1,963	25,470	14,375
Rubber thread not covered *lb.*	4,655	3,745	34,544	25,816
Totals	7,371	$6,558	60,014	$47,367
MANUFACTURED				
Bathing shoes *pairs*	55	$24	40,199	$9,278
Belting	.....	7,458	.....	70,587
Hose	.....	6,080	.....	72,826
Packing	.....	3,494	.....	40,712
Boots and shoes *pairs*	965	1,537	13,093	14,023
Canvas shoes with rubber soles *pairs*	140	122	101,581	32,418
Clothing, including waterproofed	.....	1,075	.....	30,503
Raincoats *number*	359	1,540	9,749	31,001
Gloves *dozen pairs*	411	1,292	3,773	10,133
Hot water bottles	.....	345	.....	8,322
Liquid rubber compound	.....	.....	.....	61,326
Tires, bicycle *number*	5,492	1,508	94,312	44,337
Pneumatic *number*	1,283	17,035	17,890	196,672
Inner tubes *number*	121	411	4,454	11,052
Solid for automobiles and motor trucks *number*	21	533	269	10,567
Other solid tires	.....	251	.....	8,102
Mats and matting	.....	5,373	.....	42,895
Cement	.....	3,469	.....	52,138
Golf balls *dozens*	166	451	28,168	61,186
Heels *pairs*	6,978	245	43,457	2,439
Other rubber manufactures	.....	125,786	.....	974,541
Totals	.....	$178,029	.....	$1,785,058
Totals, rubber imports	.....	$985,744	.....	$9,009,127

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$7,213	.....	$65,881	.....
MANUFACTURED				
Belting	41,260	.....	443,584	.....
Canvas shoes with rubber soles	39,719	.....	695,165	.....
Boots and shoes	253,291	.....	2,864,247	.....
Clothing, including waterproofed	34,013	.....	360,417	.....
Heels	23,032	.....	133,471	.....
Hose	21,553	.....	187,315	.....
Soles	20,170	.....	117,993	.....
Tires, pneumatic	597,274	.....	5,541,535	.....
Not otherwise provided for	.....	.....	108	.....
Inner tubes	53,750	.....	503,113	.....
Other rubber manufactures	58,700	$2,448	6,069,946	$50,612
Totals	$1,142,762	$2,448	$11,453,894	$50,612
Totals, rubber exports	$1,149,975	$2,448	$11,519,775	$50,612

Brazil

The new plant of the Goodyear Tire & Rubber Co. at Sao Paulo was expected to begin tire production last month with a daily output of 600 tires and 100 tubes.

The Cia. Brasileira de Artefactos de Borracha, Rio de Janeiro, also produces tires, and it is expected that the two concerns between them will soon be able to supply practically the entire domestic demand for tires and tubes. In 1937, Brazil imported automobile tires and tubes to a value of 45,200 contos (or millions) of reis.

U. S. Crude and Waste Rubber Imports for 1939

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Totals 1939	Totals 1938	Balata	Miscellaneous	Waste
Jan. *tons*	36,672	1,521	560	56	9	264	39,082	42,135	61	803	328
Feb.	34,185	1,463	239	348	3	252	36,490	43,930	45	685	54
Mar.	36,434	1,885	229	208	4	229	38,989	35,967	33	649	29
Apr.	27,991	784	487	142	1	196	29,601	30,807	65	275	246
Total 4 mos., 1939 *tons*	135,282	5,653	1,515	754	17	941	144,162	.....	204	2,412	657
Total 4 mos., 1938 *tons*	145,367	4,210	1,559	605	7	1,091	.....	152,839	186	2,935	156

Compiled from The Rubber Manufacturers Association, Inc., statistics.

World Auto Tire Exports

	1938	1937
United Kingdom	1,225,000	1,376,000
United States	932,000	1,016,000
Canada	720,000	863,000
France	504,000	474,000
Belgium	477,000	431,000
Italy	428,000	471,000
Germany	219,000	251,000
Japan	139,000	193,000
Total	4,644,000	5,075,000

Data from "Rubber Products Trade Notes," issued by Department of Commerce, Washington, D. C., Apr. 20, 1939.

Classified Advertisements

Continued

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CONSOLIDATED OFFERS: Hydraulic Presses, Calenders, Mixers, Mills, Tubers, Driers, Vulcanizers, Etc. Always a good deal on used machinery. Write to CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York City.

60" BIRMINGHAM MILLS, BAKER PERKINS RUBber washer, size 14-A, Adamson 8" Tubing, Hydraulic Presses, different sizes. Address Box No. 1094, care of INDIA RUBBER WORLD.

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MISCELLANEOUS

METAL BOND CEMENT APPLIED COLD WILL unite vulcanized rubber to metal, wood, or other surfaces with which it is usually difficult to secure a good bond. KENNETH R. ELWELL, La Grange, Ill.

Compounding Ingredients for Rubber
by the Editors of
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$2.50 Postpaid in U. S. A. $2.75 Elsewhere

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STOCK SHELLS HOSE POLES
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Advantages of Porotex Treatment
1. All compounds stripped easily.
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Sponge Rubber: Sheeted—Die Cut—Molded
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Adams, Arch and Union Sts.
AKRON, OHIO
European Office and Representative:
Mr. Andre Berjonneau, No. 33 Blvd. des Batignolles, 33, Paris (VIII) France.
L. ALBERT & SON

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	March, 1939		Three Months Ended March, 1939	
UNMANUFACTURED—*Free*	Quantity	Value	Quantity	Value
Liquid latex (solids)....*lb.*	4,491,951	$731,302	11,926,399	$1,988,794
Jelutong or pontianak....*lb.*	1,436,207	136,112	4,466,190	469,591
Balata ....*lb.*	32,342	5,215	203,032	30,058
Gutta percha ....*lb.*	125,224	28,894	721,586	111,955
Guayule ....*lb.*	512,100	39,520	1,491,500	135,676
Scrap and reclaimed....*lb.*	1,328,866	18,887	2,328,135	36,012
Totals	7,926,690	$959,930	21,136,842	$2,772,086
Misc. rubber (above), 1,000 *lbs.*	7,926	$959,930	21,137	$2,772,086
Crude rubber....1,000 *lbs.*	97,418	15,058,279	241,593	37,640,509
Totals ....1,000 *lbs.*	105,344	$16,018,209	262,730	$40,682,227
Chicle, crude ....*lb.*	2,762,305	$1,050,406	7,563,237	$2,570,414
MANUFACTURED—*Dutiable*				
Rubber tires....*no.*	1,668	$7,685	4,525	$12,689
Rubber boots, shoes, and overshoes ....*prs.*	1,878	347	3,284	892
Rubber soled footwear with fabric uppers ....*prs.*	71,859	17,614	178,023	33,027
Golf balls ....*no.*	19,632	2,709	30,960	4,473
Lawn tennis balls....*no.*	159,888	16,629	364,044	33,883
Other rubber balls ....*no.*	288,206	11,251	891,272	35,666
Other rubber toys....*lb.*	24,262	4,825	98,126	16,820
Hard rubber combs....*no.*	77,388	5,771	188,631	13,767
Other manufactures of hard rubber	.....	5,142	.....	6,706
Friction or insulating tape.*lb.*	8,198	1,949	30,391	8,657
Belts, hose, packing, and insulating material	.....	6,315	.....	27,264
Druggists' sundries of soft rubber	.....	7,525	.....	12,602
Inflatable swimming belts, floats, etc. ....*no.*	82,776	5,007	242,393	14,842
Other rubber and gutta percha manufactures...*lb.*	55,670	16,238	158,617	48,344
Totals	.....	$109,007	.....	$269,632

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber ....*lb.*	982,569	$171,279	3,061,974	$489,055
Balata ....*lb.*	9,331	2,803	13,809	4,404
Other rubber, rubber substitutes and scrap....*lb.*	.....	.....	56,913	4,074
Rubber manufactures (including toys)	.....	1,286	.....	2,308
Totals	.....	$175,368	.....	$499,841

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ....*lb.*	1,693,322	$82,837	4,781,530	$237,168
Scrap ....*lb.*	9,830,728	155,369	25,781,518	367,914
Cements ....*gal.*	49,621	76,859	107,868	133,770
Rubberized auto cloth.*sq. yd.*	11,955	5,895	39,988	19,840
Other rubberized piece goods and hospital sheeting..*sq. yd.*	273,164	100,787	692,935	261,959
Boots ....*prs.*	23,008	49,186	32,014	70,439
Shoes ....*prs.*	33,899	14,865	49,507	23,905
Canvas shoes with rubber soles ....*prs.*	66,464	41,705	144,005	92,502
Soles ....*doz. prs.*	6,406	12,219	12,207	23,919
Heels ....*doz. prs.*	53,845	28,076	133,388	70,924
Soling and top lift sheets.*lb.*	51,426	9,551	183,087	32,428
Gloves and mittens..*doz. prs.*	9,321	21,123	21,620	49,348
Water bottles and fountain syringes ....*no.*	24,157	8,458	56,419	19,544
Other druggists' sundries....	.....	55,843	.....	154,633
Gum rubber clothing....*doz.*	40,178	79,788	94,114	168,948
Balloons ....*gross*	40,137	29,828	89,269	67,680
Toys and balls....	.....	12,670	.....	28,323
Bathing caps ....*doz.*	8,792	18,318	16,775	33,725
Bands ....*lb.*	24,382	9,220	56,395	22,559
Erasers ....*lb.*	26,692	14,242	67,617	37,604
Hard rubber goods				
Electrical battery boxes.*no.*	18,437	12,670	59,183	40,178
Other electrical ....*lb.*	28,045	8,152	79,207	21,981
Combs, finished ....*doz.*	12,925	8,249	26,493	17,630
Other hard rubber goods....	.....	16,220	.....	42,387
Tires				
Truck and bus casings.*no.*	26,460	525,165	70,624	1,401,110
Other auto casings....*no.*	67,675	733,372	185,858	2,077,580
Tubes, auto ....*no.*	62,314	102,985	179,519	280,706
Other casings and tubes..*no.*	7,543	54,075	20,680	147,542
Solid tires for automobiles and motor trucks....*no.*	72	3,629	196	7,559
Other solid tires....*lb.*	12,547	3,338	55,691	10,746
Tire sundries and repair materials ....*lb.*	221,211	68,303	499,866	151,820
Rubber and friction tape..*lb.*	94,277	24,286	193,535	54,519
Fan belts for automobiles.*lb.*	48,228	29,863	140,760	84,085
Other rubber and balata belts ....*lb.*	252,467	137,778	713,734	381,756
Garden hose ....*lb.*	94,904	18,852	214,205	40,693
Other hose and tubing....*lb.*	476,942	181,978	1,178,821	445,631
Packing ....*lb.*	106,771	45,466	293,195	131,129
Mats, matting, flooring, and tiling ....*lb.*	131,922	22,546	339,110	53,718
Thread ....*lb.*	78,269	69,213	156,963	137,518
Gutta percha manufactures.*lb.*	181,763	50,243	279,732	80,945
Other rubber manufactures..	.....	121,464	.....	305,507
Totals	.....	$3,064,686	.....	$7,831,872

Imports by Customs Districts

	March, 1939		March, 1938	
	*Crude Rubber		*Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	11,588,206	$1,918,000	6,938,946	$1,103,201
New York	63,191,973	9,795,075	75,255,366	10,623,636
Philadelphia	1,223,496	185,642	2,065,173	326,118
Maryland	1,067,568	150,359	976,314	126,316
Georgia	1,617,752	239,967	957,750	122,802
Mobile	519,906	76,994	.....	.....
New Orleans....	3,918,393	584,559	3,094,061	437,840
Galveston	44,800	6,916	44,750	5,773
El Paso	133,000	2,613	.....	.....
Los Angeles	18,181,398	2,727,337	4,497,438	666,137
San Francisco	919,218	138,977	327,915	44,374
Oregon	16,800	2,662	14,220	2,300
Indiana	.....	.....	477,798	128,611
Ohio	.....	.....	990,308	266,564
Colorado	.....	.....	56,000	10,344
Totals	102,422,510	$15,829,101	95,696,039	$13,864,016

*Crude rubber including latex dry rubber content.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
2618	Manufacturers of water curing vulcanizer.
2619	Manufacturers of rubber band cutters.
2620	Suppliers of latex for pyroxylin coating.
2621	Manufacturers of metal fittings required in the rubber industry.
2622	Manufacturers of a carpet covered stair tread or a tread combination of carpet and rubber.
2623	Suppliers of a rubber and glue mixture.
2624	Manufacturer of children's rubber gloves.
2625	Manufacturers of "plate lifters."
2626	Suppliers of Saponin.
2627	Manufacturers of rubber mill knives.
2628	Suppliers of Lycopodium.
2629	Suppliers of ammonia carbonate in capsules.
2630	Manufacturers of latex impregnated paper.
2631	Suppliers of rubber for molds to withstand temperatures of from 500 to 600°.
2632	Suppliers of pulverized lead.
2633	Suppliers of old pneumatic tires (in pieces).
2634	Manufacturers of green rubber tubing.
2635	Suppliers of rubber compounds for the typewriter industry.
2636	Suppliers of retreadable tires.
2637	Manufacturers of women's half-rubbers.
2638	Manufacturers of bathing shoes and other bathing articles of rubber.
2639	Source of supply of obsolete press goods molds.
2640	Supplier of cement which will bind rubber to leather and will be elastic when set.
2641	Information wanted on low-temperature vulcanization.
2642	Manufacturers of nails and washers for pneumatic heels.
2643	Manufacturers of heel-washer setting machine.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
†1453	Non-poisonous colors for rubber balloons	Basel, Switzerland
*1457-58	Rubber raw materials....	London, England
*1461	Surgical rubber goods....	Cairo, Egypt
*1463	Tires and druggists' rubber sundries...	Bogota, Colombia
*1516	Automobile rubber accessories....	Cairo, Egypt
*1522	Rubberized fabrics	Stambul, Turkey
†1589	Tires	Mombasa, East Africa
*1612	Tire vulcanizing machinery....	Istanbul, Turkey
*1617	Tires	Cairo, Egypt
¶1618	Sponge rubber strips and sheets....	Lyon, France
‡1619	Rubber-ply belting and mechanical rubber goods	Calcutta, India
*1636	Rubber goods	Reykjavik, Iceland
†1652	Rubberized and impregnated raincoat material	Zurich, Switzerland
†1695	Bathing caps	Singapore, Straits Settlements
*1718	Rubber sheeting, air-cushion	Olso, Norway
*1719	Rubber and balata belting and sanitary articles	Santiago, Chile
†1723	Infants' bottles, toys, and novelties....	Toronto, Canada
‡1729	Medicinal and surgical rubber goods...	Tel-Aviv, Palestine
*1749	Balloon toys	Cairo, Egypt
†1755	Surgical gloves	Olso, Norway
†1760	Pneumatic tired wagons and carts....	Malmo, Sweden
‡1769	Storage batteries	Accra, Gold Coast, Africa
‡1834	Rubber sole machinery	San Jose, Costa Rica
†1851	Sheet rubber	Brussels, Belgium
‡1854	Household rubber articles and toys....	Brussels, Belgium
¶1861	Toys and novelties	London, England

*Agency. †Purchase. ‡Purchase and agency. ¶Purchase or agency.